An Investigation into Performance, Stress Level, Auditing and Evaluation of Core Skills Training among Staff Working in Emergency Operation Services, Search and Rescue and Disaster Response Teams in Abu Dhabi Police GHQ

دراسة تقييم المهارات الرئيسية ومستويات ضغوط العمل وأثر ذلك على أداء عينة من منتسبي أدارة الطوارئ وفريق البحث والإنقاذ بالقيادة العامة لشرطة أبو ظبي

By

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Auditing and Evaluation of Emergency Operation Services, Search and Rescue and Disaster Response Teams, AD Police GHQ, UAE

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ABSTRACT

The present research investigation was designed to evaluate the performance, stress level, core skills training and competency of Emergency and Public Safety response team members including those who work in the Search and Rescue team in Abu Dhabi Police (ADP) GHQ. However, this research project has also taken the psychological approach and used the General Health Questionnaire (GHQ-30, Goldberg, 1967, 1972, 1978, Goldberg & Hillier, 1979) to assess stress level among staff and leaders working in emergency response and public safety administrations teams at ADP GHQ. Overall this study is an attempt to investigate the main factors which contribute to the vulnerability of staff and the inadequate performance while responding to routine emergency work.

The present investigation employed a mixed (qualitative and quantitative) descriptive research design, and involved a sample of (539) staff participants who were of different ages, gender and levels of experience. All participants were working at the time in the Emergency and Public Safety Administration and some were members of the International Search and Rescue team ADP GHQ.

The main literature relevant to this investigation is covered in two main chapters (i.e. chapters 1 and 2) of this research project. Main results of this study indicated that more than half of the surveyed sample (62.5%) were in the age group of 18–28 years, followed by 31.5% in the age group 29–39 years. Female participant staff working in Emergency and Public Safety were represented by 4.3% of the participants included in this study. Hence the majority of staff were male. That is 95.7% of participants were males holding appropriate relevant Higher Education qualifications. The majority (80.5%) of the sample were involved in daily fieldwork such as ambulance emergency work or participation in the rapid intervention and civil defence as well as international rescue mission activities including participation in manmade and natural disasters.

Further, more than half of participants in the sample were satisfied with the training and efficiency of the equipment they use for their daily duties. More than half of the sample (62.3%) view their preparations as appropriate and good. Moreover, 14.8% (n = 80) declared that their preparedness for the service is excellent. Results of local and international participation indicated that 73.8% of previous participation of the sample members was local; mainwhile (26%) of the sample had involvement in international missions.

Focusing on occupational stress level, other outcomes of this study indicated that the males in the study sample scored higher levels of health-related stress compared to their female colleagues: the mean score of male participants was 2.2176 compared to female participants' score of 2.0130. When position within the group was calculated and included in the analysis as a variable, it was found that the heads of sections and main fieldworker participants (those two subgroups) scored higher on the GHQ (M = 2.3833; 2.3155) respectively; followed by admin and other staff (M = 2.1784 and 2.1387).

As expected, results shows that new and inexperienced EPS staff members (with less than 1 year of service) were likely to score higher on the GHQ (mean score 2.5359). Also those who participated in prior specialised emergency training programmes, scored lower on GHQ than their counter-group participants who had no prior emergency staff development training. Level of education and vulnerability to stress among participants as reflected by the GHQ mean score was also significantly important. It seems that widowed and divorced staff were more vulnerable to stress than their single and the married staff member counterparts.

ACKNOWLEDGEMENTS

DECLARATION

I, Ahmed Naser Al Raisi, do hereby declare that, except where stated otherwise the material of this research work here is entirely my own original work. It has never been presented to any other university or institution. Some of the ideas used in this research have been taken from other authors to help support my views and these have been duly acknowledged. Therefore, I declare this is my original work. It is hereby presented for fulfilment of Professional Doctorate (Prof Doc) Degree in Community Policing and Safety with Special Focus on Auditing and Evaluation of Emergency Operation Services and Disaster Response in Abu Dhabi.

Signed: Ahmer Naser Alraisi

Date: 8.4.2013

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Date: 10.4.2013

DEDICATION

To the memory of my father who was an inspirational life-long mentor and my role model

I dedicate this work to all those professionals who work in emergency services, and who I know work hard and tirelessly. Every day in emergencies, crises and disasters they save lives, prevent disability and promote well-being

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CHAPTER 1

INTRODUCTION

1.0 Research aims, rationale and related literature

Around the globe, every day there are emergency and non-routine critical incidents which demand the core skills, and prior professional training and effective response from all members of emergency response teams. For example, the recent (April 2013) Boston Marathon bombing attack, the terrorist attack on the World Trade Center in New York on 11 September 2001, the 7 July 2005 terrorist attacks in London and Manchester city centre, the Hillsborough football ground disaster and the Madrid terrorist train bombing on 11 March 2004 which killed over 191 people and wounded 1,800 passengers all required professional skills and courage of staff working in emergency professions and search and rescue teams. The present study intends to evaluate the skills of several emergency response team members and addresses the following questions: How are various emergency response team members prepared for their task(s)? How are they trained? How are they monitored? This research project will also adopt a psychological approach to the assessment of stress level, cognitive, social and emotional skills of staff and leaders working with emergency response and public safety teams. Hence do we know what skills they need? Are these skills being trained effectively? Are there mechanisms in place to evaluate the competence of those with responsibility for critical decisions and incidents? In sum, this investigation is designed to evaluate professional stress level among emergency team members and then identify core skills that are needed for staff working in emergency response and public safety teams in Abu Dhabi Police GHQ.

Other questions that are addressed in this investigation are:

(1) Do safety guidelines exist in several organisations that are designated to provide relief and emergency care in crises and disasters?

(2) Are there defined roles for the key players in the crisis management team?

(3) Are the communication protocols and the crisis organisation structure defined?

(4) Have crisis management briefing and training sessions often take place?

(5) Are specific role training courses often available and in place?

(6) Are there corporate crisis exercises to test and practise the plans which run frequently from desk to exercises and involve external stakeholders' participation?

(7) How do senior management and existing policies deal with general occupational stress and the workloads of staff working in such demanding environments?

(8) Is there any planned emergency policy(ies) that locates itself at a level at which it can make a significant impact on human lives during disasters?

(9) Are there back-up business continuity plans in place should disasters occur?

Overall and as noted, this study is an attempt to investigate the main factors which contribute to the vulnerability of members of emergency teams and possibly the manifestation of professional fatigue and hence inadequate performance while responding to routine emergency work, managing crises and/or disasters.

The present investigation involved a sample of members of teams responding to emergency and those who engage in potential international rescue and search efforts in Abu Dhabi Police GHQ. The latter are represented by members of the UN recognised Search and Rescue team, and members of the Emergency and Public Safety Administration of Abu Dhabi Police GHQ.

As well as highlighting the main aims and objectives in this chapter, other issues which will be discussed here in depth – in this particular section of the thesis – include the concept of stress, sources of stress in emergency and disasters, disaster and emergency staff stress, staff performance and work-related stress in emergency conditions, stress and decision-making in emergency settings, stress reactions and individual differences, stress and coping during disasters, preparedness, disaster management and ethical considerations. This section will also describe the efforts of Ministry of Interior and the author's influence on strategic development of several initiatives on policing, emergency, public safety and security. The author of this thesis – in his post of director of central operations at AD Police and who has chaired for several years the higher committee for projects and modern technologies – was among the first to pay considerable attention to and hence adopt the paradigm or the notion of value of investment and return in public projects, namely the Return on Investment (ROI) approach (Al-Raisi & Al-Khouri, 2010). Several projects have seen the contribution and the involvement of the author of this thesis. One demonstration of his particular vision on public value return of investment was the supervision, development and implementation of the Iris recognition project. This project was conducted and completed in partnership with Cambridge University laboratories. Other projects that the author has supervised or been involved in include the use of biometric for disaster victim identification, e-border system, airport e-gate system, facial recognition project, GIS projects, the development of the UN recognised Search and Rescue team, the development of a national ID card project and

the establishment of the Disasters' Victims and Casualty Bureau in ADP GHQ. The latter is linked with Interpol. It is worth noting that most of these projects are aimed at effective public safety and public trust, police security, staff and human resource development and crime prevention projects. Also it should be emphasised here that all these projects are linked to the past and to the present 2012–2016 Abu Dhabi police strategy. Furthermore, most recently the author has taken the lead in the development of an e-court system and the creation and development of the Emergency Medicine Academy (EMA) in AD Police GHQ. The latter is a joint venture with the Emergency Medicine Department of Harvard University Medical School and aims to provide a high quality and intellectually challenging education in pre-hospital emergency medicine and paramedic training that prepares candidates to make a positive contribution to society. It also aims to educate (through CPD programmes) highly qualified professional staff and prepare them to work effectively in pre-hospital care and emergency departments. The EMA will introduce and familiarise trainees and candidates with advanced emergency procedures and approaches that support patients' well-being and safety during emergencies. A detailed account of some of these projects will be discussed later in this chapter.

Disasters are natural, manmade or technological catastrophic events where a vast number of vulnerable people experience a crisis and suffer severe damage or disruption of ordinary life in a way that makes recovery extremely difficult without any assistance. Examples of natural disasters include earthquakes, tsunamis, hurricanes, tornadoes and cyclones which may result in the deaths of many vulnerable individuals. Vivid examples of such disasters include the 2004 Indian Ocean tsunami that killed more than 200,000 people after a quake off Sumatra, and the recent Hurricane Sandy which was the deadliest and most destructive tropical cyclone of the October 2012 Atlantic hurricane season, as well as the second most costly hurricane in United States history. Preliminary estimates assess damage from this particular hurricane at nearly $75 billion. Though Hurricane Katrina in August 2005 was the worst in the history of the USA, at least 285 people were killed along the path of Sandy in several countries such as Jamaica, Cuba, the Bahamas and United States.

Examples of technological disasters include the Chernobyl disaster which was a catastrophic nuclear accident that occurred on 26 April 1986 at the Chernobyl Nuclear Power Plant in Ukraine which was then under the direct jurisdiction of the central authorities of the Soviet Union. The Chernobyl disaster is widely considered to have been the worst nuclear power plant accident in history, and is one of only two classified as a level 7 event on the International Nuclear Event

Scale. The other was the Fukushima Daiichi nuclear disaster which occurred in Japan in March 2011. Manmade disasters (those caused by war, social, political and economic events) may be equally catastrophic.

Disaster response and risk reduction activities are also believed to be important catalysts for social change. Hence disasters (both manmade and natural) are very big and challenging phenomena to human existence particularly when related to wars, genocide, famine or drought.

Various studies (Dynes, Demachi & Pelanda, 1987; Smith, 1992, Dynes, 2003, Dynes and Drabek, 1994) emphasise the importance of metrological events, the human response to physical and psychological trauma, economic, legal as well as political consequences of disasters. Those authors view disasters as deviations from the normal curve of social functioning. Hence, for recovery to take place individuals must return to normal. Due to the fact that most emergency and disasters are complicated by human actions, this makes the impact of disasters a challenge to the government, nation or humanitarian bodies and emergency staff involved in helping people affected by these crises.

Although disaster may affect anyone, it is evident that when disaster occurs, certain classes of people or gender or age group are more vulnerable to the impact of the events than others. The risk and vulnerability that individuals face from natural disaster or manmade disaster are products of their social situation as well as their physical environment (Blaikie et al., 1994, Pincha, 2008). Vulnerabilities, capabilities of nations and its individuals and social groups determine individuals' abilities to cope with disaster or to recover from it. Factors such as social networks, gender roles, health status, social status, power relationships as well as geographical location affect risk and vulnerability to disasters and the capacity of individuals to respond adequately to them.

The poor, women, children and the elderly are noticeably those who suffer most during disasters, whether manmade or natural. For example, the earthquake which hit Guatemala in 1976 affected disproportionately the slum dwellers that had the highest mortality rate compared to the middle class whose homes were well protected. Due to this difference in social class, the disaster ended up being termed by some the 'class-quake' rather than earthquake (Blaikie et al., 1994). Other examples are the 2004 flood and the tsunami which hit India in Tamil Nadu and the recent earthquake in Pakistan. In all these catastrophic events females are more vulnerable than males. This issue was discussed by Pincha (2008) who noted that in any disaster, more women are affected than men, and more severely.

It is therefore important to analyse disasters to determine the risks that people can face in everyday life and the vulnerability to such hazards events as they occur. Such analysis is an important step to show how disaster should be perceived within society more broadly; and hence help build policies to address or reduce the impact of disaster and mitigate possible crises (Blaikie et al., 1994). Any planned policy has to locate itself at a level at which it can make a significant impact on human lives.

Disaster management and aftermath also should not only focus on the disaster or crisis itself, rather it should always have planned policies which are designed to reduce both vulnerability and disaster itself. It is important that humanitarian bodies put in place policies to address pre-disaster conditions and individuals' failure to cope. Indeed many humanitarian agencies have tried to redesign their roles in terms of preventing disasters rather than 'treating' their impact (Hagman, 1984; Hewitt, 1997; Dynes and Drabek, 1994).

Training of emergency response teams is also in crisis intervention. Looking beyond unpredictable and unpreventable catastrophic events, organisations and countries are advised now (by various UN agencies) to put in place training programmes for those personnel who will be involved with disaster management. This is because maintaining effective performance under high stress conditions is a challenge to emergency rescue team members during any form of disaster, whether natural or manmade (as will be discussed in a later section of this document). However well-trained, when disaster strikes response team members may be overwhelmed by the sheer scale of the situation, and may call for help from other countries. Indeed the recent earthquake disaster in Haiti had to be supported by many international organisations and countries to assist the relief efforts and reduce the number of human casualaties.

1.1 Emergency staff and stress

1.1.1 Definition of stress

Stress has been defined by different scholars in different ways. However, in the past two decades, stress has taken on a more transactional definition, thus from a stimulus–response definition to a more transactional paradigm (Cox & MacKay, 1981, Cox, 1978). Stress can be defined as an organism's total response to environmental pressures or demands imposed on that organism. For humans, stress results from the interactions between the individual and the environment that are perceived as exceeding their adaptive capacities and are threatening to their well-being (Cox, 1987). Driskell & Salas (1996) define stress as a process by which certain

environmental demands tend to evoke an appraisal process in which perceived demands exceed resources available which results in undesirable physiological, psychological, behavioural or social outcomes. Since the environment presents a lot of demands that an individual has to face, this means that individuals have to live with these stressors, adjust to them or perish through negative coping strategies. If stress is not managed at an early stage it can become chronic and this eventually becomes life threatening and lead to disorders such as high blood pressure (HBP), peptic psychosomatic illnesses, and psychological problems like depression, anxiety and post traumatic stress disorder (PTSD), to mention only a few. Morgan & Bowers (1995) identified eight distinct types of stress: psychological, cognitive, environmental, occupational, organisational, physiological, social and teamwork. In this literature, the main focus will be on occupational stress among response or emergency team members during and after catastrophic (disaster) events.

While discussing stress resulting from disasters or major crises, it is worth noting that recently the National Center for Crisis Management and the American Academy of Experts in Traumatic Stress (www.nc-cm.org) wrote to all their members reminding them to use their guidelines to address stress that related to the tragic event that occurred at Sandy Hook Elementary School in Newtown, Connecticut, USA in December 2012 (discussed below). The message in that letter which circulated to all members of this professional organisation suggested that

> *those close to this event and directly impacted will have to contend with this horrific experience in the short-term and long-term as the psychological ramifications of this event emerge. All will likely be impacted in some manner and will have to cope with their own feelings and the feelings of others with whom they come into contact in a personal and professional capacity.*

The message was that professionals have to come up with a plan to address the emergent psychological needs of those directly and indirectly impacted by this event. And the overall aim is to assist people in keeping them functional.

Discussed below are guidelines material from *A Practical Guide for Crisis Response in Our Schools* (6th Edition) and *Comprehensive Acute Traumatic Stress Management*, both publications of the American Academy of Experts in Traumatic Stress. They include useful information for assisting professionals in addressing the psychological needs of those impacted by tragic events.

On 14 December 2012, Adam Lanza, aged 20, shot dead twenty children and six adult staff members and wounded two at Sandy Hook Elementary School in the village of Sandy Hook in the town of Newtown, Connecticut. Before driving to the school, Lanza had shot and killed his mother, Nancy Lanza, aged 52, at their Newtown home. After killing students and staff members, Lanza committed suicide by shooting himself in the head as first responders arrived. The massacre was the second-deadliest school shooting in United States history, after the 2007 Virginia Tech massacre. The National Center for Crisis Management and the American Academy of Experts in Traumatic Stress (www.nc-cm.org) have recently published the following useful guidelines for all individuals involved, including victims and professionals:

- Practical Suggestions for Assisting Children in the Aftermath of a Tragedy
- Teacher Guidelines for Crisis Response
- Parent Guidelines for Crisis Response
- How Do People Respond During Traumatic Exposure?
- Helpful Information During and After a Traumatic Event

Hans Selye, the founder of the concept of stress, described stress as an essential part of life, a factor that touches everyone's life no matter who they are, what they do or where they live. Selye (1976) stated that:

> the beggar who suffers from hunger and a glutton who overeats, the little shopkeeper with his constant fears of bankruptcy, and the rich merchant struggling for yet another million; they are all under stress. The mother who tries to keep her children out of trouble, the child who scalds himself with a cup of hot coffee is also under stress.

This definition of stress shows that not all stresses that humans face are negative. Selye named positive stress Eustress and negative stress Distress. Thus, minimal stress which is brief or normal (Eustress) can motivate our performance and result in a greater achievement as in the case of the rich merchant or an athlete who is preparing to win a competition or a student who is preparing for exams. Although stress is essential especially when it protects us in times of trouble or helps us to adapt in changing situations, it can also be dangerous to our health. Stress can be compared to a tension on the string of a guitar or violin, where enough makes good music, little makes no music and too much just snaps the string. Thus, two much stress which is above

individuals' threshold or optimal stress tolerance level (Distress) affects performance on an individual basis can be fatal if not coped with appropriately.

Selye (1976) developed a theory of the influence of stress on people's ability to cope with and adapt to the pressures of injury and disease. He discovered that patients with a variety of ailments showed many similar symptoms, which he attributed to the body's efforts to respond to the stresses of being ill. Selye proposed the General Adaptation Syndrome (GAS). GAS is a model of how the body responds to stressful situations in the short and long term. In a laboratory experiment conducted on rats, Selye subjected rats to excessive exercise, surgical injury, cold and sub-lethal doses of drugs that caused pain to the rats. He found that the same physical responses existed in animals when they were put under stress. From the results, he then noted that stress plays some role in the development of every disease and that if stressors are not coped with, diseases which result from poor adaptation such as high blood pressure or ulcers can result. Selye concluded that it is not the stress that harms individuals, but distress that results from stress. Selye described the stress response as occurring in three different stages. These are the alarm-reaction stage, the response stage and the exhaustion stage (Selye, 1976).

Stage 1: The alarm-reaction stage 'fight or flight'

This is the stage in which the individual perceives and evaluates a situation as a stressor. This perception then triggers an alarm reaction that prepares the body for action. In this initial shock phase, the body responds with a drop in blood pressure and muscle tension which lasts for a very short time, after which the body is alerted to possible threat. The bodily reaction is then initiated by the hypothalamus and regulated by the sympathetic branch of the automatic nervous system (ANS) and the endocrine system which then prepares the individual for 'fight or flight'.

Stage 2: The reaction stage

In this stage, the body starts to recover from the initial alarm reaction; whether an individual can eliminate the stressor or not, the individual starts to cope with the situation. Although the endocrine and the sympathetic activities drop slightly, the body still continues to draw on more resources, using them faster than they are replaced. This is the stage at which the immune system of an individual is suppressed making the body prone to infections and diseases. This physical damage is due to the prolonged production of corticosteroids. However, if the stressor is removed during this stage, stress is unlikely to develop into distress and to cause physiological damage to the body.

Stage 3: The exhaustion stage

Due to persistent exposure to the stressor, the body can no longer cope at this stage. The individual has few, if any, reserved resources left to deal with the stressor. This is the time when a slight additional stressor can have an exaggerated effect on the body. Higher brain centres tend to ignore the negative feedback system and maintain the excitation of the pituitary gland. This enlarges the adrenal glands producing more adrenaline which causes the hormones not to function properly. This is the stage where all the body's resources are totally drained and the body is exhausted, with no more defence left to deal with long-term stress. This results in psychosomatic illnesses such as constant headache, insomnia, lack of appetite, peptic ulcers, high blood pressure or other problems.

1.1.2 Lazarus' cognitive appraisal model

Richard Lazarus argued that in order for a psychosocial situation to be stressful, it must be appraised and that cognitive processes of appraisal are central in determining whether a situation is threatening, challenging, or constitutes harm. Lazarus mentioned two types of appraisal: primary and secondary. Primary appraisal is influenced by both internal and external factors and triggers the selection of coping strategies. Primary appraisal includes the perception of how stressful the situation is. When an individual has more or less than adequate resources to tackle the situation, the cognitive appraisal of a stressful situation will be affected. Thus, if the individual critically analyses the effectiveness of the coping mechanism used for the situation and realises that it has no effect, then he or she will change the strategy used to suit positive coping. Problem-focused coping is then directed at managing the problem, while emotion-focused coping strategies are used for the negative emotions. Secondary appraisal is the evaluation of the resources available to cope with the problem and those that may change the primary appraisal (Lazarus, 1966).

In relation to Lazarus' cognitive appraisal of stress, Hancock and Szalma (2007) advanced a similar stress theory and framework. The appraisal mechanism, through which individuals evaluate events in terms of their meaningfulness to their psychological or physical well-being, means that stress is a transaction between the individual and the environment. These transactions, however, occur at different levels of adaptation which range from genetic entities to social behaviour levels. For example, when events are appraised in terms of an individual's goals, they can produce negative emotions or stress if such events are appraised as hindering progress.

However, when events are appraised as facilitating progress towards a goal (congruent emotion), they promote well-being and pleasure (Hancock & Szalma, 2008). Thus, individuals regulate their internal states and engage these mechanisms to compensate for perturbations induced by external events, like task demands.

1.1.3 The Concept of allostasis

The term 'allostasis' is defined as the adaptive process for actively maintaining stability through change, meaning that the brain plays a very important role in the evolution of stress (Sterling & Eyer, 1988), If all the mechanisms are simultaneously controlled, the brain can enforce its command and incorporate influential factors such as experience, memories, anticipation and re-evaluation of needs in anticipation of physiological requirements. Allostasis is therefore important during both predictable and unpredictable disaster such as storms, hurricanes, earthquakes, civil wars or bombings. The central idea is that cumulative wear and tear (allostasis load) to the body arises if mediators or adrenal hormones, neurotransmitters, or immuno-cytokines are released too often or if they are ineffectively managed (McEwen, 1998; McEwen & Wingfield, 2003) as compared to Stage 2 of GAS discussed above.

Due to the fact that individuals react differently to crisis and environmental conditions, this means that the way an individual accumulates stress will differ greatly from individual to individual and the allostatic loads will also be affected in different ways. This makes some individuals more vulnerable or susceptible to disaster and stress-related diseases than others. This also relates to Charles Darwin's work where he argued that, in the animal kingdom, individuals differ from one another in their adaptive qualities and limitations. Thus, in a natural environment there are some individuals whose survival advantage allows them to live longer than others in order to reproduce and pass on their traits to the next generation through natural selection (Darwin, 1859). Thus, different organisms adopt different behavioural strategies in order to cope with disasters and stressors that they are faced with. It is important to realise that natural selection maximises reproductive success of adapted organisms even at the expense of individual happiness, health or connectivity.

1.2 Sources of stress

Stress can be caused by both negative and positive stressors and these stressors may be from both external and internal sources. The external stressors are those which are social and physical, while internal stressors are those occur within the individual such as emotions.

Biological stressors are any biological pressures made on the mind and body to adapt. They are living systems which attack and exploit the mind and body such as parasites, viruses, fungi, bacteria or predators. Physical stressors are any physical pressures made on the mind and body to adapt and include chemicals, toxins, fire, electricity, heat, bright light, and pain or trauma of any type. Social stressors are those which are non-voluntary such as assault, rape, arson, murder, theft and any crime against humanity or property. Others include political entities such as civil war, injustice, recession, income tax, housing, health hazards or freedom of mobility. Social stressors may also be voluntary such as financial loans, mortgages, personal friendships and work relationships, contracts which involve consecutive payments like credit cards, relationship problems, deception, childbirth, marriage, divorce or death. On the other hand, internal stressors are those pressures that are produced by maladaptive functioning of the mind and body. These include maladaptive negative emotions. In this work more emphasis will be placed on those stressors which are physical and political in nature and cause or can cause biological or internal stressors.

1.3 The effects of stress

Stress has mostly been associated with negative events and consequences. There is, however, no justification for the view that stress responses always compromise health or welfare. Although the functional aspect of stress has been neglected, the paradox of stress lies in the simultaneity of its adaptive nature and its possible maladaptive consequences. Stress can affect either physical or mental state of an individual, or both. Most material on the subject of 'stress' deals with mental stress. But prolonged physical stress is the main entity that causes major mental illnesses, other illnesses and diseases. And that leads to even more stress, both mental and physical. Risk factors for stress-related illnesses are a mix of personal, interpersonal and social variables. These factors include lack or loss of control over one's physical environment, and lack of social support networks. People who are dependent on others (e.g. children or the elderly) or who are socially disadvantaged (because of race, gender, educational level or similar factors) are at greater risk of developing stress-related illnesses (Oliver-Smith, 1996).

A link between exposure to stress and the development of coronary heart disease in some individuals has been attributed to the difference in type of personality. Thus, different personality types respond differently to stressful situations, and individuals who have low coping ability are more likely to experience coronary heart disease than those with high coping mechanisms. Friedman & Rosenman (1974) discovered that individuals with Type A behaviours (which

constitute almost 50% of the general population) are more prone to heart disease than individuals with Type B behaviours. They explained that stress is linked to coronary heart disease in two ways. Firstly, stress activates the sympathetic branch of the ANS as discussed earlier, causing constriction of blood vessels and rise in blood pressure and heart rate. As such, more blood is pumped through the shrinking arteries. With prolonged exposure to stress, this causes damage to the arteries. Secondly, individuals with Type A behaviours tend to have higher level of adrenaline and noradrenaline and a higher cholesterol level in the blood, which is part of the physiological stress response especially when stress activates the hypothalamus, pituitary and adrenal glands. Hormones from these glands increase the fatty acid levels in the blood thereby depositing fatty materials on the walls of the arteries, narrowing the diameter of the arteries and reducing the efficient flow of oxygenated blood to the rest of the body and to the heart. In most cases this causes heart failure.

Other risk factors include feelings of helplessness, hopelessness, extreme fear or anger, experience of extreme trauma, and cynicism or distrust of others. The most extreme events and reactions may elicit post traumatic stress disorder (PTSD), an anxiety disorder that can develop after exposure to one or more terrifying events that threatened or caused great physical harm. PTSD is a severe and ongoing emotional reaction to an extreme psychological trauma; as such, it is often associated with soldiers, police officers, fire-fighters and other emergency personnel. Actually, stress-related disorders such as PTSD have long been recognised as common sequelae following severe psychological stress (Hosin, 2007). Such stressors may involve viewing someone's death, a threat to the patient's or someone else's life, serious physical injury, or threat to physical or psychological integrity. In some cases it can also result from profound psychological and emotional trauma, apart from any actual physical harm. Yule and colleagues have shown that post traumatic stress symptoms and rates of PTSD increase with the severity of disaster events (Yule et al, 2000). For example, persons who suffer personal injuries or significant financial loss in natural disasters are likely to have more symptoms (Green, 1991). Depending on the severity of the event, rates of PTSD have been found to vary from about 5% to 22% (Green & Lindy, 1994).

There is always interaction between the mental state, immune system and the nervous system and the interconnections of these systems. A number of studies (Dhabhar & McEwen, 1996, 1997; Ader & Cohen, 1975) have documented the link between stress, the immune system and illness. These studies have also suggested that stress reduces the efficiency of the immune

system, thus lowering the body's resistance to diseases, through the over-production of corticosteroids as already discussed under the Exhaustion Stage of the GAS. A study to show that the immune system is suppressed when an individual is exposed to extreme stress was carried out on laboratory mice (Riley, 1981). Mice were subjected to extreme stress by being put on a rotating turntable and the mice's lymphocyte counts were measured after five hours when they were found to have decreased. This showed that the immunities of these mice were greatly suppressed, most likely due to the stress of sitting on the turntable. In another similar study to study the link between stress and growth of tumour cells, cancer tumours were implanted into two groups of mice. One group was subjected to high stress of being rotated for 10 minutes per hour for 3 days and the other group had no stress. The group with no stress had no tumour growth probably due to their high immunity, whereas those under high stress developed very large tumours, presumably because of lowered lymphocyte counts (Riley, 1981). Immune system changes can increase vulnerability to infection, and have been observed to increase the potential for an outbreak of skin disease especially psoriasis. Chronic stress has also been shown to impair growth and development in children by lowering the pituitary gland's production of growth hormone, as in children with a home environment involving serious marital discord, child abuse or alcoholism.

E. L. Cohen (1952) noted that stress can lead to a loss of flexibility or to greater problem-solving rigidity at either individual or group levels. In addition, Cohen and colleagues describe the effects of stress on teamwork to include goal displacement or losing the overall team objective, group-think in which the team is slow to change or innovate and disrupted communication (Cohen et al., 2000). Effects of stress on teamwork can also be described as causing a narrowing or loss of team perspectives (Driskell & Johnson, 1998). In agreement with this, it was found that auditory distraction task load and time pressure were among variables that caused loss of team perspective, which in turn was responsible for decreased performance (Driskell, Salas & Johnson, 2001).

1.4 Review of concept and models of stress

Stress, as a complex phenomenon, involves an interaction between the demands of the environment and the perception of an individual on how to cope with these stressors. An individual will experience stress especially when the perceived demands of the environment are greater than the perceived ability to cope with the stressors he or she is faced with. This makes stress a health risk to everybody. Although our bodies are well adapted and able to deal with

short-term stressors, we are not well equipped to deal with prolonged or intensified periods of psychological stressors especially those that result from modern-day disasters, both natural and manmade. Research has indicated a clear link between stress and the development of coronary heart disease especially in individuals with Type A personality who are at higher risk of developing heart disease as a result of extreme stress. Stress also reduces the immune system and lowers the body's resistance to disease through production of corticosteroids. Work or occupational stress (a topic associated with the current aims of this research project) is the main and most frequent source of stress that individuals experience. This involves workload, stress level, role ambiguity, job insecurity and job satisfaction. The professionals who are most likely to experience work-related stress are the police, rescue workers, fire-fighters, prison officers, social workers, staff in psychiatric hospitals, and teachers. Having looked at the concept of stress and its effects on the individual, it is important that organisations develop and implement effective coping strategies like employing well-trained occupational psychologists who can help individuals cope positively with the different stressors, so that stress does not develop into distress and in the end become fatal. In the next sections, stress will be discussed in relation to disasters and the rescue team members who are involved in saving lives when disaster strikes.

1.5 Emergency staff performance and work-related stress

People discuss stress in different ways; some talk about positive stress (motivational) that causes them to perform and achieve, others see stress as negative especially for those whose threshold tolerance of stress is low. This latter group is at higher risk of suffering from the consequences of stress including professional fatigue and hence cannot perform under high pressure (Figley, 2005).

In recent years, workplace stress has been regarded as the main source of stress. High levels of stress in work settings lead to increased absenteeism from work, sickness and/or poor performance in terms of quality and quantity as well as increased use of alcohol and drugs (Hancock and Szalma 2008). Although most workplaces involve some kind of stress, the teaching profession, social work, police force and prison services have been ranked as the most stressful occupations (Hancock and Szalma, 2008). Work-related stress is known to result in negative physical and psychological effects for the individual. It is therefore important that companies employ occupational psychologists who are able to identify sources of stress in the workplace,

both in terms of the work itself and the work environment. This may have a beneficial effect on working conditions in terms of staff performance, psychological well-being, guidance and counselling. The psychologist should also be able to identify and give advice about appropriate methods of reducing stress in work settings.

1.5.1 Stress and performance

Currently, the impact of stress on performance has been documented to be on the increase as compared to any other time in history. This is because we live in an increasingly complex, high technology world in which the potential for catastrophic error and disasters has greatly increased (Hancock & Szalma, 2008), with manmade catastrophic events going head to head with natural disasters. Catastrophic situations – both manmade and natural – are highly stressful events and impose severe levels of stress on the professionals working in emergency settings. Recent manmade events include the plane crashes into the twin towers of the World Trade Center in 2001; the 2009 'miracle' of the Hudson River, where the pilot worked very hard under extreme pressure and managed to land the plane on the river saving all passengers and cabin crew on board; the 7 July 2005 bombings in London; the Mumbai bombings in 2011; the consequences of the war in Iraq and Afghanistan; and suicide bombing in the Middle East. Natural disasters such as the recent earthquake and floods in Pakistan, volcanic eruption in Iceland, earthquakes in China and Haiti, tsunamis, cyclones and tornadoes have all placed great pressure on emergency response teams, governments and all humanitarian bodies involved the world over. Indeed, all these circumstances put operators under extreme pressure, causing them to make decisions under very extreme stress, yet the consequences of poor performance under these conditions might be catastrophic. Although requirements for effective performance under stress have been present for a long time, it is likely that modern technology systems have increased both the stress under which we must perform and the consequences of poor performance.

1.5.2 Stress and performance among emergency team members

Teams such as emergency medical staff in accident and emergency departments, paramedics, fire-fighters, police officers, military personnel, airplane controllers and those in nuclear power production plants perform tasks under extreme environments characterised by dynamic, psychologically demanding and time-pressured workloads, subject to information overloads with severe consequences for errors (Flin, 2006); they are working conditions in which more than one stressor, if not all types of stressors already discussed, must be managed in the normal course of

work. These demands create a lot of pressure and stress which need to be dealt with if tasks are to be accomplished. Stress is inevitable, it is part of life. Therefore, we need it in small and manageable amounts for us to perform. It is said that we are the present product of the past stresses we have experienced (Hancock & Szalma, 2008). If this is the case, then adaptation is based on the properties of the task, the environment, and the operator's management of physiological states, which can be initiated by the system itself or the operator. This means that an individual needs to regulate workload, stress and fatigue in order to reduce the adverse effects of stress and enhance performance. In support of this, a number of studies have shown that adaptive systems can enhance performance and at the same time preserve the benefits that well-designed automation can bring (Hancock & Szalma, 2008). Similar to individual response to stress, a number of studies have documented that individual differences – personality and coping mechanisms – account for large differences between and within individuals in the ability to remain focused on the task and to maintain goal-oriented behaviour (Hancock & Szalma, 2008; Lee, Sheldon & Turban, 2003).

A number of researchers have shown that time pressure has a direct impact on team decision-making and performance (Hancock and Szalma 2008); others have argued that performance decrement does not occur under time pressure because team members become more focused on their task under periods of stress (Gaillard, 2008). However, other scholars showed that too much stress eventually leads to performance degradation (Entin & Serfaty, 1999); while Epstein (1983) argued that the way stress is perceived can also decrease team cooperation and performance. Indeed, Driskell, Salas & Johnson (2001) argued that under critical period of stress, there is a shift from a broader team perspective to a narrower, individualistic approach or focus. This is further supported by Hancock & Szalma (2008) who stated that under extreme stress, team members are more likely to shift from a team level task perspective to an individualistic level which results into degraded team performance and suggested that teamwork skills would be more important in this situation such that teams can perform even under a high stress environment.

Working in stressful situations (such as those of emergency team response members) requires a lot of energy and this puts a lot of pressure on the cognitive capacity of an individual. Therefore, for an individual to perform under great stress, he/she should have cognitive power which is efficient, thus emotion, motivation and effort all need to be considered (Gaillard, 2008). Several researchers (Hancock & Szalma, 2008)) have documented that workload and stress impact

performance due to errors that result from the difficulty of gathering critical information and making accurate decisions. However, Kleinman & Serfaty (1989) found that workload altered communication patterns. Thus, when workload increased from low to medium the frequency of task-related communication also increased but as workload increased from medium to high, the rate of communication decreased drastically. Hancock & Szalma (2008) argued that increases in workload have also been directly linked to changes in decision-making. In support of this, Drabek & Haas (1969) found that team members who performed semi-autonomously during periods of low workload used more consultative decision-making as workload increased. Performance under extreme stress becomes more pressing especially in high technology battlefields as the equipment may not be properly operated by soldiers whose cognitive abilities are already degraded by the stress (Buckalew, 1988). In addition, individual perception and differences are strongly noted to be related to performance under stress (Driskell & Salsa 1996).

In difficult situations of cognitive overload, fatigue, stress or loss of motivation, the level of performance may greatly be reduced even when the task may seem relatively easy or highly important. This can in turn inhibit and distort information processing. Several studies have documented inefficient and non-productive behaviours as not only being determined by the amount of work, but also by the way the work is organised in terms of autonomy, task allocation, communication, coordination, work rest-schedules and feedback. Performance is also determined by psychosocial factors such as social support network coaching, rewards and commitment to the work and organisation (Gaillard, 2008).

This concept of cognitive processing should be borne in mind when a crisis happens and the response team have to lend a hand in managing the situation. Perhaps it can be an avenue through which personnel and professionals involved in rescuing people and managing adverse situations can be helped so that they do not reach the level of diminishing returns or burnout. Karasek & Theorell (1990) claim that the absence of the above mentioned factors may lead to absenteeism, strain, high staff turnover, burnout and cardio-vascular diseases. This implies that any measure to augment cognition should not only focus on improving cognitive abilities, but should also examine how cognitive processing depends on energy, motivational and emotional factors. Hence, to prevent the degradation of cognitive processing caused by stress, it is important to enhance positive factors within the work or a person's characteristics.

For an individual to perform under great stress, the effects of stress and fatigue on cognitive processing need to be minimised. Cognitive processes such as rational decision-making and

cognitive appraisal of the stress situation will be influenced by affective processes. For example, if we are threatened or have negative emotions in our cognitive information processing, we tend to regress to basic, rigid behavioural patterns (Staw, Sandelands & Dutton, 1981). Therefore, for one to be able to perform under excessive stress, it is important that the individual moderates the negative emotions by self-regulation, using reassurance, relaxation techniques or proactive behaviours, or seek training that will make the individual concentrate on the tasks while expressing distracting negative emotions (Hancock & Szalma, 2008).

An individual's performance under stress can continually be evaluated by cognitive control. Thus, while on duty it is important to evaluate one's performance as to whether or not it meets set criteria for the task. This will help personnel or response teams to estimate whether more work needs to be performed or whether a strategy needs to be changed or improved. In fact, cognitive control plays an important role in the way distraction, fatigue and stress affect cognitive processing. This also determines how individuals' attentions are distributed over the different elements of the tasks helps to determine whether a change in strategy is needed when the accomplishment of the task is in danger (Hancock & Szalma, 2008). Cognitive control also makes use of task sets which encompass the actual knowledge and information in working memory necessary to perform a particular task. This not only contains targets and time schedule to accomplish set goals, but also the way of working and performance criteria as well (Hancock & Szalma, 2008). Therefore, each time individuals engage in task performance, the task set needs to be actualised and refreshed in working memory. When a task is interrupted, the task set must be built up again when the task is continued. The more complex the task, the larger the task set will be, thus, the more time and effort is required to build it up. For example, when rescue teams have to exhume human bodies from under rubble of buildings destroyed by earthquakes like the recent Haiti disaster, or the World Trade Center in 2001, the tasks become very complex, requiring more teams and time in the hope of finding survivors. In addition to this, Klein (1996) noted that stressors such as complex workload do not degrade performance; rather it results in a strategy change in team processing.

In pre-disaster preparedness, and while planning the task on a cognitive level, all personnel involved need to be sufficiently motivated, not only to execute the task of rescuing victims, but also to invest extra energy in terms of effort and tolerating negative feelings of stress and fatigue that come with stressful events that are often threatening and demanding (Gaillard, 2001). Therefore, being highly motivated means attaching high value to realise the set goal and prioritise

what activities need to be done first. However, if priority of activities is not considered, there is likelihood of becoming vulnerable to harsh conditions due to low levels of motivation, hence the incentive to carry out task diminishes and becomes weaker and the willingness to expend more effort also becomes low. This is more evident in employees or rescue personnel who have reached the point of diminishing returns.

Concentration is a prerequisite to develop and maintain goal-directed behaviour. Thus, individuals are able to concentrate when they have a concrete plan to realise the set goals. Concentration regulates attention by directing, filtering and switching of attention between elements of the tasks. It also manages individual energy supplies needed before task performance, distribution of energy over the work period, mobilising extra energy through mental effort, deactivation and recovery from work. In fact, if progress is to be evaluated, individuals need to take into account how adequate their current energy level is to meet the demands of the task and how much effort is needed to accomplish the task (Hancock & Szalma, 2008).

When processing capacity is abundant, a deviation from the optimal state will not result in a reduction of performance efficiency. Therefore, in well-trained tasks that do not require much capacity, the range in which performance remains optimal is quite large. However, in complex or novel task situations that require all of one's individual resources, even a small deviation from optimal may result in a performance decrement. The majority of bodily processes are regulated automatically and unconsciously. The execution and the planning of tasks prompt energy mechanisms to bring the brain and body gradually into a state that is optimal for efficient processing, hence determining the available cognitive capacity.

Since the energy mobilisation under mental effort is voluntary, it can be down-regulated at the moment the task is accomplished. In contrast, energy mobilised by the perception of threat, for example, may continue even when the stressors are no longer active, inhibiting proper recovery. Mental effort can only be maintained for a relatively short period, since the physiological and psychological costs are high in terms of fatigue and strain.

Further, Wachtel (1968) noted that when an individual is experiencing extreme stress, his or her attention is diverted inward to interpret novel or unfamiliar stress-related reactions, and that less attention is then devoted to external task-related stimuli. If stress causes such effects in the members of a rescue team, then it is important to train personnel with cognitive control techniques which will help them in times of stress to regulate emotions and distracting thoughts

and to maintain task orientation. This is in line with Johnston and Cannon-Browers (1996) who noted that stress strategies may include developing meta-cognitive, cognitive, psychomotor and physiological control skills.

In addition, Gaillard (2001) noted that effort is needed when there is a risk that lapses in attention will result in performance deterioration. Lapses in attention may be due to low energy as a result of insomnia or fatigue, or energy being disrupted by emotions. More effort is needed when tasks require controlled processing because of inconsistent or varying input–output relations, when there are heavy demands on working memory, when divided attention in complex multitasking environments is required and in new learning situations where skills have to be acquired. Moreover, Veltman and Gaillard (1997) argued that there is no direct relation between task difficulty and effort and that increases in task difficulty only result in mobilisation of extra energy through mental effort when the operator is motivated to do so. This explains why specific motivational variables like feedback or bonuses have larger effects on indicators of effort than changes in task difficulty and suggests that effort mobilised depends on motivation, energy supplies and type of tasks.

Hancock and colleagues have argued that individuals who are more mastery oriented are less concerned with their performance and are adaptive to challenging situations for self-improvement and learning, whereas individuals who are perfectionist and more performance oriented are more concerned with demonstrating high performance and avoid failure of any sort (Hancock & Szalma, 2008).

Although emotions mostly have negative connotations in both cognitive psychology and the stress literature, they can also have a positive influence. In fact, emotions play an important role in motivating people to embrace task goals and maintain goal-oriented behaviour, although strong emotions may also interfere with cognitive processing. Bearing all these factors in mind, it should be noted that although stress is part and parcel of daily living, it will be exacerbated by both natural and manmade disaster situations. Thus response team effectiveness will depend on how well services prepare them to perform under very stressful conditions that they might encounter.

1.6 Stress and decision-making

In today's world, different teams within the public or private sectors operate under situations where cognitive demands can be overwhelming, leading to stress and corresponding catastrophic errors. This is more evident among personnel teams who are faced with decision-making amidst

high intensity crises. In fact several studies Driskell , Sala and Johnson, 1997; Cannon-Bowers & Salas, 1998) have documented that stress not only impacts on general performance but also degrades the decision-making and performance abilities of individuals. Decision-making is therefore a vital component of managing crisis situations. Decision-making is an essential component of response teamwork if these catastrophic events are to be controlled or managed appropriately.

In stressful situations decisions are known to be made by teams, rather than individuals. For example, in the event of any crises that occur, personnel always work as a team and hence make decisions as a team. This is supported by Klein (1993) and Orasanu & Salas (1993) who argued that in modern work environments decisions are increasingly being made by teams rather than individuals, although there are still deficiencies in the field of team decision studies. However, it should also be noted that challenges exist in team decision-making especially for those individuals whose agenda may be different from those of their colleagues, especially those who are not willing to communicate personal knowledge and information to fellow team members. In such cases, team decision difficulty is known to cause delays in achieving the common goal. Importantly, individual motives, perceptions, sub-agendas and experience levels influence the reliability, validity and manner in which information is not only communicated, but combined. Furthermore, reduction in team situation awareness has also been noted to impact on decision-making and coordination: in fact research has shown that hierarchy and stress interact within teams and decision-making activities shift to higher levels in response to stress (Hancock & Szalma, 2008: 183)

Under team decision-making there are seven different models which can be used by individuals in times of crisis. Classical decision-making theory is concerned with how to choose between different options, after evaluating all the alternatives in a systematic and linear matter in terms of time and resources available. According to the multi-level model, team decision-making (Ilgen et al., 2005; Ilgen and Jones, 2001) information is gathered in a systematic manner or based on its importance and reliability which is then used to integrate the various pieces of information into a coherent decision (Hancock & Szalma, 2008). Decisions, individuals, dyad and team are four levels under which decision-making is better understood and under which team decision-making is most effective.

This framework applies most accurately to teams that are hierarchical in their structure. This means that team members play a role in the decision-making process by providing the leaders

with information and recommendations based on their interpretation of the available data. Hence, the team leader is accountable for the integration of this information and is responsible for the selection or proposing final recommendations. Although the framework illustrates the factors considered in weighting team members' inputs, Ilgen and colleagues have been criticised due to their assumption of exhaustive search strategies.

Naturalistic decision-making theory focuses on appropriate categorisation of the situation (Klien, 1996. It focuses on describing the cognitive processes of skilled decision-making and relies on situation–action matching decision rules, whereby decision-makers determine which action to take after matching features of the current situation to their experiences over a systematic evaluation of all available options. Naturalistic decision-making is also a context-bound model based on experience and/or empirically based prescriptions where the value of a recommendation is determined by its implication and not its optimisation (see Hancock & Szalma, 2008: 185).

Another theory known as the recognition primed decision-making (RPD) model has three main variations which differ in terms of resource availability. The first variation views decision-making as a straightforward pattern-matching exercise based on previous experience which occurs when time pressure is high. It has the ability to influence decisions based on first options, resulting in a feasible decision because the decision-maker's experience provides a guiding example of possible reaction for the identified events. This theory is known to do well especially in situations of extreme time pressure which do not require careful consideration (Hutton et al, 2008). Under the second variant, when time pressure is lower and mental simulations are required to include features of the current situations, uncertainty is managed by identifying key parameters which are apparently reasonable and grouped together. The final variation of RPD also employs mental simulation of possible action, but continues this to completion and examines possible consequences. If any of the outcomes is found to be unacceptable, then the simulation is adapted and re-examined. All in all, RPD is a forward-focused model towards goal-state; therefore if the goal changes quickly, it allows the decision-maker to update the situation assessment without needing to restart the whole plan based on late-stage plans (Ross et al., 2004).

The recognition model of decision-making emphasises processes such as critiquing and correcting (Cohen, Freeman & Worf, 1996). Under this model, decision-making is carried out in two strategic moves. One involves recognition activation of expectations and associated responses which include RPD, while the other is an optional process of critiquing and correcting.

Under this model, the decision-maker identifies relationships within the situation, and builds a model that accounts for all the observed relationships. The decision-maker then corrects the model, plans to respond to any identified problem and then takes control of the process, carrying out a quick test that regulates the entire process in terms of available time, costs of error or uncertainty (Cohen, Freeman & Worf, 1996).

The advanced team decision-making (ATD) model (Hancock & Szalma, 2008) combines multiple behaviours that are critical to decision-making. Thus, team identity is where every team member participates in achieving set goals and avoiding micromanagement. Under this model teams are able to express the goals and process of the team in specific concrete language with the help of available resources. This creates a bridge in the team decision-making. Teams also need to monitor their progress against the set goals and resources which allows teams to accomplish all of the tasks before deadlines or go back to the drawing board to re-prioritise such that the most important goals are met first.

The contingent operation stress model (COSMO) developed by Kontogiannis (1996) regards decision-making as based on a continuum from recognition to analytical strategy. It argues for an interactive process of making decisions about the nature of the problem, types of alternative solutions and methods for risk minimisation. This model consists of seven stages: early appraisal, problem formulation, recognition and selection of option, situation reassessment, goals or options evaluation, plan task, implementation and monitoring. All these stages are dependent on each other. However, if the situation is deemed familiar, then reassessment and evaluation of goals can be bypassed and the sequence can then follow the model – early appraisal, problem formulation, recognition, option selection, plan task and finally implementation and monitoring of decision – followed by the course of action (Hancock & Szalma, 2008).

The above discussion has focused on team decision-making, with little information provided on team decision-making under stress. This reflects Morgan & Bowers' (1995) argument that, 'a review of the existing knowledge base regarding team decision-making reveals only a few theoretical papers and even fewer empirical investigations of the factors that influence decision-making performance under stress.

As already discussed, ambiguity as a factor related to team decision-making can cause more harm than good in managing decisions if not handled with great care. For example, if roles are not clearly defined, individuals may not know when and how to pass on relevant information to

their colleagues. This is supported by work done on military personnel, where it is argued that military personnel or leaders (commanders) will always be asked to make decisions under uncertain and ambiguous conditions; and yet failure to interpret information correctly within this uncertainty and ambiguity will lead to teams which produce less effective decisions and perhaps poor corresponding performance outcome (Hancock & Szalma, 2008).

Cooke et al. (2000, 2001) and Hancock & Szalma (2008) emphasised that teams must take a proactive approach to ensure that members not only correctly interpret information at an individual level but communicate information to team members explicitly or implicitly and share relevant pieces of information that facilitate problem formulation and option generation which lead to the final decision. Cooke et al. summed up that teams that are successful are able to interpret environmental cues correctly and take actions based on these interpretations. Decision-making as a component of disaster management requires personnel to be motivated to do tasks allocated independently or under supervision. It has already been noted that motivation can affect performance. For example if stressors increase motivation to perform well, then performance will be affected in a positive way, hence decision-making is also affected positively (Driskell & Salas, 1999). Under high pressure shifts in decision-making strategies are seen and output levels rise to the same level as in low time pressure conditions. However, this shift is facilitated by the presence of shared mental models and leaders directing coordination.

Cognitive decrements can have disastrous consequences for decision-making, in that alternative cues and options are often ignored. It has been found that time pressure and excessive workload lead subjects to use fewer cues, while a source of task interference such as impending danger narrowed the range of attention and restricted the perception of cues (Driskell & Salas, 1996). However, Edland & Svenson (1993) noted that narrowed attention is not always dysfunctional especially if decision-makers can select the most meaningful cues and spend less attention on irrelevant cues. Further research has also found that stressors reduce the capacity of working memory, through the interference with inner speech that disrupts active rehearsal for working memory and through secondary tasks of managing stress reactions, which in turn affects the speed and accuracy as this requires decision-makers to respond with less information or assessment. Hence, common sets of cognitive impacts for different stressors need to be used. For example, Peptone and colleagues documented that accurate decision-making under time pressure is enhanced by prior contingency planning and that planning allows personnel or crews to develop strategies for further use (Hamilton, 1982).

Using naturalistic decision strategies, decision-makers can draw on experiences that rapidly reorganise the dynamic of a situation, and which help them to know how to react to events. In fact, it is been noted that combat stress is the most significant causes of loss of manpower (Coomler, 2012), and that battle fatigue differs from other ordinary stress reactions in that it is disabling to the point that service members are not able to do their jobs (Driskell & Salas, 1996). In addition, it is noted that lack of effective management of battle risk factors worked severely against the Iraqi army and possibly caused defeat (McCaughey, 1991).

It is also advisable that display designers should not try to pack in too much information or encourage more systematic methods of scanning displays if a decision is to be reached. In fact, it has been shown that excessively large team size causes interference in communication and that this results in conformity and a loss in flexible response and socialisation biases, affecting team decision-making. On the other hand, it is argued that within large teams more members can increase overall efficiency, thus generating more ideas and possible solutions due to more and different perspectives (Cohen et al., 2000). Team structure has also been suggested to influence stress and team decision-making in that it impacts the coping strategies team may select to deal with conflict and problems, which in turn affects the amount of stress at the team level and their team decision-making outcomes (Hancock & Szalma, 2008).

It should be noted that the type of and amount of information that is shared within teams will influence the manner in which the problem is formulated, which in turn influences actions in the decision-making process. Hence, team members must be willing and committed to communicate personal knowledge and information to fellow members (Shaw & Penrod, 1964), since team decision-making comprises of multiple information sources and tasks or cues which need to be combined in order to generate the final decision.

1.7 Emergency staff, stress reactions and individual differences

Stress is known to be moderated by individual differences and availability of support and resources (Jones & Fletcher, 1998). Each one of us has our own unique set of problems and our own unique ability to solve them. So the things that may be stressful to one person may not be stressful to another. But this definition of stress allows us to understand and handle stress in an effective way, regardless of the source. Natural selection tends to maintain a balance between different behavioural traits and strategies as described in the 'Game Theory' work carried out by Maynard Smith (1982). In addition, natural selection describes individual differences in relation to

stress in terms of survival of the fittest, thus there are genes for survival. This relates to what Raup (1992) termed 'bad genes or bad luck'. Thus species that can adapt to a particular environment will survive; however, those that cannot adapt will perish. This means that the degree of both physiological stress and psychological stress that an individual or species can tolerate has a central role in who survives and what form that survival takes. Hence, individuals who are unable to cope with stress, even mild or normal stress, will end up becoming distressed, suffer from various diseases and eventually become victims of stress. This indicates that human stress responses reflect differences in personality, as well as differences in physical strength, general health and coping abilities.

Due to these variations in traits, each individual reacts differently to similar situations. Take an example of trained soldiers (a homogeneous group) whose training is supposed to make them react in a standardised way to say frontline experiences. It is still uncertain whether each individual soldier will react in a similar way to the extreme stress of combat experiences (Hancock & Weaver, 2005). This makes individual differences an evident source of variation which requires knowledge and ways or techniques of handling personnel exposed to stressful situations such as soldiers, fire-fighters or other response teams. It is documented that individuals' characteristics such as efficacy, task skills anxiety and perceived control influence task performance. Self-efficacy has also been found to have an implication for stress perception because the subjective assessment of whether the individual or team has the skills necessary to perform the task is an important factor in its success (Schwarzer, 1992 Bandura, 1997). Thus, it is good to screen individuals/ personnel for specific problems with stressors such as text anxiety or anger and hostility in order to enhance the effectiveness of stress exposure training (Driskell et al).

1.8 Stress and coping during crisis and disasters

Disasters do not only directly affect health through violence or trauma: the effect on the natural social and economic infrastructure decreases access to education and damages public health systems. It is important that health systems and communities prepare to cope in advance as this minimises excess morbidity and damage. It is good to put in place emergency and cost-effective public health measures that can help save lives. It should be noted that, over the long term, distress can lead to diminished health and/or increased natural tendency to illness, therefore stress must be coped with and properly managed. Stress management encompasses techniques intended to equip a person with effective coping mechanisms for dealing with psychological stress, with stress defined as a person's physiological response to an internal or external stimulus

that triggers the fight-or-flight response as already discussed before. Therefore, stress management is effective when a person uses strategies to cope with or alter stressful situations.

There are several ways of coping with stress, such as controlling the source of stress or learning to set limits and to say 'No' to some demands that bosses or family members may make. A person's capacity to tolerate the source of stress may be increased by thinking about another topic such as a hobby, listening to music or being in the company of friends who are able to provide social support. It is important to focus on the present, although previous traumas might be reactivated by present disaster, and hence need to be addressed as well. If skills needed to perform are available, then this is likely to buffer stress response by reducing the perceived lack of resources available to overcome a demand. Self-efficacy therefore is known to moderate stress perception due to the difference in coping strategies that an individual can use (Hancock & Szalma, 2008). It is also documented that collective efficacy as relates to teamwork is vital to reduce stress levels within a team due to an increased propensity for helping and cooperating with the team during stressful events (Gore, 1987). Several studies have also documented that individuals who have high self-efficacy are more likely to use effective problem-solving approaches, whereas those with low self-efficacy are more likely to use emotion-based strategies that involve negative coping such as worrying (Lazarus & Folkman, 1984).

Moreover, coping and adjustment during distressing times is closely linked to a person's available social supports, which serve as a buffer against stress (Cohen & Wills, 1985). Any disruption to a person's social support, regardless of the presence of a stressor, tends to be associated with reductions in psychological health. This is further emphasised by Salzer and Bickman (1999: 77), who explain that

> the destruction and disruptions caused by disasters suggest that tangible support and efforts to rebuild social networks and sense of community should be the primary focus of efforts to enhance the psychological health of disaster victims. Mental health interventions aimed at re-establishing social support networks include bringing families, neighbourhoods, and the larger community back together as soon as possible after a disaster.

To cope with disaster stress, there is need for social support resources, both internal resources for normalising reactions, and time for organising family and friends for support. Social support has been found to act as a buffer to stress (Cohen & Wills, 1985). In addition, it is important to include family of the response team in the follow-up, as questions family members ask might

provoke the experience again. Some questions, such as what shall we have for dinner when a partner has just returned from saving lives in a dangerous situation, or shall we do this or that, or why on earth did you chose such a horrible job, may make an emergency worker who has returned home irritable, guilty or even go on the defensive and explode. For that reason, families need to be educated and supported such that they support their partners or relatives and help them cope with these stressors in a positive way (Cook & Bickman, 1990).

For response teams to cope with stress, they need psychological debriefing. In fact, the concept of psychological debriefing needs to be part of the normal functioning of the responding services in the organisational routine. This needs to take place after certain kinds of events, or else the response team will be prone to developing secondary trauma, which in the long run might lead to post traumatic stress disorder (PTSD) (Kenardy & Carr, 2000).

Combat stress from Israeli and other combat experiences has been used to test a model based on cognitive theories of stress and coping that emphasises the individual's response to stressful conditions (Lazarus & Folkman, 1984). This combat stress model is known to be interactional in that it contains individual, unit and battlefield characteristics acting through cognitive interpretations of the antecedent variables that affect the individual's appraisal of the combat situation which in turn results in the combatant's mode of response in coping with the realities of combat (Driskell et al 1996, 1998).

To help personnel cope better with their experiences of the catastrophic event or during the event itself, it is important to give reassurance to the emergency team while giving them information about the nature of the event as this can enhance their coping skills. In agreement with this statement, Driskell & Salas (1996: 260) noted that

> trainees may be informed that their experience of stress is normal, that others have performed the tasks required from them successfully, despite difficulties, that people often have more coping resources than they themselves believe they possess; that certain tasks tend to be seen as more frightening from afar than when they are actually performed, and that the trainers are highly skilled and competent to provide the trainees with effective means of coping.

1.9 Mental health and secondary traumatisation

Effective disaster management is a matter of putting in place the appropriate resources/mechanisms prior to a crisis that will help to minimise the chances of a crisis occurring and managing it more effectively once it has occurred. This involves taking note of the level of damage caused by the event, its impact on the functional status of the components of society affected, identifying the needs that result from the damage, and determining what is needed in terms of material goods and human needs. Much as societal functions and sub-functions depend upon the supplies of goods and services, it should be noted that there is a threshold below which supplies of goods and services are unable to provide all of the required functions. When setting up an intervention, one needs to bear in mind the target outcome and the benefits to those affected, what this crisis is likely to cost, and to set up goals and objectives of the intervention in terms of effectiveness of the response.

Crisis or disaster management requires the ability to think systematically. Critical thinking not only allows us to respond to problems effectively after their occurrence, but it also allows us to anticipate problems before they happen and before it is too late to do anything about them. Effective crisis management requires the integration of critical thinking with emotional intelligence and learning from past mistakes . It has been found that just thinking about the unthinkable prior to its occurrence makes one much more able to think on one's feet and hence to recover from crisis once it has occurred. Thus, the fact that one has anticipated the unthinkable means that one is not paralysed when it occurs (Mitroff, 2001).

If an organisation or government is to manage major crises effectively or prevent their escalation, there needs to be creative thinking among the personnel involved and necessary assumptions made. Thus, when responding to major crises, it is always important to respond to the emotional needs of others first, those who are affected by the disaster. Emotional needs must be responded to from the victims' perspective rather than the organisation's or government's. If individuals or government or the rescue team are to handle major crises, they need to think of the unthinkable. This involves going to the core of one's organisation to identify its deficiencies and flipping it on its head in order to make a highly dramatic and visible statement. Nonetheless, it should be noted that an organisation or government might do very well in managing one particular disaster, whereas it might not handle another disaster or crisis in another area well. Therefore, there should be a central point at which information on lessons of crises all over the world can be

stored and disseminated in order to learn from other people, countries or organisations on how to manage particular disasters or crises.

Crisis communication is an important component of any disaster management. Communication is essential in preparing for disaster or in the management of crisis. Thus, the provision of information about the event is a prerequisite. Over the past few decades, a number of countries have set up disaster management information systems according to their own specific needs. Disasters are unpredictable and occur suddenly like earthquake, floods, tornadoes or cyclones. Communication facilities for disaster management are very important as they may help to convey information at the right time so as to handle and minimise the effects of disaster. Communication allows all professionals who are involved in the course of events to react efficiently in a coordinated manner. In fact, communication has been found to play a key role in managing crises and this includes sharing information about problems that develop, intentions and goals as well as task allocation (Kanki & Palmer, 1993). More so, strategic behaviours that are necessary for decision-making and task management are also mediated by communication. In disaster management, there should be pre-disaster information on how to get the information, such as from the research and analysis department in the country concerned (Mitroff, 2001). There should also be post-disaster information that records where and when the disaster occurred and what steps were taken to help people recover from the aftermath. Therefore, information needs to be coordinated in the form of reports in an upstream manner and as instructions in a downstream way, thus ensuring horizontal and vertical flow of information among response teams.

Communication and information coordination in the face of disaster requires cooperation from all the departments and organisations involved. This includes an efficient networking service, device configuration, data management and resource scheduling. Therefore, communication infrastructures need to be efficient, e.g. through ad hoc wireless networks for disaster onsite, especially in the most critical areas of the disaster or danger. There should be personal or body area networks for frontline personnel (with robust mobile terminals and sensors), terrestrial truck radios and satellite technology. In fact these days satellite communication plays a major role in disaster management communication. Communication facilities can also be set up for rescue and relief operation purposes.

Technology has also been found to increase awareness and help in communication (see Chapter 2). Advanced technology and GIS have been found to be instrumental in disaster communication (Hollingshead & McCrath, 1995). Although technology has the potential to mitigate the perception

and impact of stress on team decision-making, the reverse is also true. Therefore, system designers need to take into account human limitations and principles of good human design while designing technology that is expected to reduce workload. In addition, a database needs to be created to allow easy integration, recording and analysis of the current situation. It is important to provide relevant data for analysis of post-disaster lessons learned and for training purposes. All organisations involved in the rescue effort need to interact closely at various levels.

When disaster strikes, it is not only the people who have suffered injuries who are affected. It also impacts on the mental health and subsequently the performance of those who are rescuing, healthcare providers (e.g. therapists) who assist survivors and victims of trauma, the onlookers (eyewitness), etc. (see Figley, 1995, 1999, 2005; Bride, 2007; Canfield, 2005; Brewin et al., 2000; Dutton and Rubinstein, 1995; Pearlman & Sackville, 1995; Cunningham, 2003: 452). Secondary traumatisation has been reported among professionals working with traumatised individuals through exposure and while engaging in helping or wanting to help them (Figley, 2002; Meadors et al 2009). Secondary trauma has received attention in recent years particularly within mental health professions (Bride, 2007; Ortlepp & Friedman, 2002; Salston & Figley, 2003).

The area of secondary traumatisation stress (STS) is a fast developing professional discipline. Figley and other pioneer research workers mentioned above have discussed the impact of working with victims of trauma. These researchers have highlighted frameworks for understanding the main psychological impacts and increased awareness on how STS affects the lives of many professionals working with survivors and victims of serious trauma. Indeed, there are many factors that contribute to the onset of STS beside other protective factors. Though there is resiliency among many trauma survivors due to the presence of protective factors it is not in doubt that STS exists (see Figley, 2006; Baird & Jenkins, 2003; Argentero & Setti, 2011; Baum, 2010; Adams and Riggs, 2008; Stamm and Varra 1992) and affects a range of professionals and traumatised individuals. Those affected include emergency staff, paramedics, clinicians, social workers, psychiatrists, psychologists, councillors, police and public security staff, rescue workers, fire-fighters and nurses working in intensive care units. This section aims to highlight the concept of STS and related factors that contribute to its onset among professionals working in emergency and public safety departments and other caring professions.

Figley (1995) has suggested there is a cost for caring which could have a huge impact on a person's life and those involved in providing care for victims of trauma. Similarly, Arvay (2001a) suggested the symptoms are often manifested among organisational heroes, i.e. among those

who are self-sacrificing and dedicated to care. Other researchers (Figley, 1995a; Maslach et al., 2001; Adams and Riggs, 2008; Baum, 2010, 2012a, 2012b) suggested those who are dedicated to care are potentially vulnerable to STS. What seems to be most important is that STS indirectly affects (Figley, 1995a,b, 2002; Beaton and Murphy, 1995; Boscarino et al., 2004a; Ackerly Arvay, 2001a,b; Creamer and Liddle, 2005; Bride, 2007) individual professionals including therapists, clinicians, mental health professionals, rescue workers, fire-fighters and other emergency staff whose jobs and main work bring them into frequent contact with victims and survivors of traumatic events. It has also been suggested (Dutton & Rubinstein, 1995; Ortlepp & Friedman, 2001; Beaton and Murphy, 1995; Figley, 1995a, 2002a) that carers and professional clinicians who do not have sufficient time to meet their own needs for rest, family care, social support and professional development are likely to be vulnerable to compassion fatigue or STS.

Further research focused on STS began to appear in journals and written books from the late 1970s (Figley, 1995 a,b, 2002, 2007; Wilson and Lindy, 1994; Ting et al., 2005; Stamm 1995, 1997; Sabin-Farrell and Tarpin, 2003; Pearlman and Saakvitne, 1995a, 1995b; Pearlman, 1999; Kadambill and Truscott, 2003; Baum, 2010). All these research works highlighted the cost of caring among professionals working with victims and survivors of trauma. Cunningham et al. (2004) and Chrestman (1999) suggested that there is a greater risk associated with higher levels of exposure to traumatic material (Cunningham, 2003: 452). Though research (Way et al., 2004: 49) has also suggested that the effects of trauma on professionals are lower when therapists or professionals have more experience in working with trauma than in people new to this work. It seems also that personal history of trauma in the therapist is a risk factor.

It is worth noting that the reference to human reactions to stress can be traced back to the beginning of the last century. The many factors that account for the development of this field include the growing need to respond to the long-term consequences of PTSD and exposure to traumatic events, including exposure to manmade and natural disasters such as war, atrocities, floods, earthquakes, physical and sexual abuse, etc. Some research workers (Hosin, 2000, 2007; Hoods, 2007; Lubit, 2007) noted that the publication of the third edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-III) by the American Psychiatric Association (APA) in 1980 was a major turning point in the field of trauma psychology and impacts on survivors such as war veterans, refugees, rape or sexual victims and other survivors of both manmade and natural disasters. The DSM-III (APA, 1980) officially recognised the diagnosis of post traumatic stress disorder (PTSD) for the very first time. Indeed, it was the first time that the common

symptoms experienced by trauma survivors were viewed as a psychiatric disorder, hence requiring diagnosis and treatment. At a later stage in the revised DSM-IV (APA, 1994), PTSD symptoms and criteria were fully acknowledged and the disorder became known to many professionals working with traumatised individuals, including lawyers, therapists, emergency professionals, and researchers. Hence since the publication of DSM-III voluminous amounts of empirical research have been published covering the range of symptoms that survivors and victims of trauma may manifest.

This early research includes the vulnerability of care providers such as counsellors, therapists, paramedic, nurses, clinicians and other professionals working closely with trauma victims who appear at risk of developing what is now known as compassion fatigue or STS (see Figley, 1997, 1999; Yassen, 1995, Pearlman & Saakvitne, 1995a, 1995b). Secondary traumatisation stress has also been described as vicarious traumatisation (Figley 1995a, 1997, 2002,) and counter transference (Figley, 1997); burnout (Figley, 1997). The term compassion fatigue was also used interchangeably with STS because it was thought the caring profession is a 'noble' profession with particular focus on helping victims of trauma and survivors of markedly distressing events, hence including those who had been indirectly affected and who *provided considerable care and attention for trauma victims* (Figley & Stamm, 1997). Figley (1995a) described STS further as the stress from *helping or wanting to help* a traumatised or suffering person. Figley also indicated that STS can emerge suddenly, without any warning. There is a sense of helplessness and confusion that is felt along with isolation from supporters. This vulnerability is attributed to professionals for a number of reasons including the fact that trauma workers and therapists are always surrounded by trauma-inducing factors such as empathetic involvement with the survivors and victims of trauma. For Figley (see later discussion section) empathy, compassion and few other closely related factors are key factors in the induction of traumatic material from the primary to the secondary victim.

Further multidisciplinary research conducted by psychologists, psychiatrists, clinicians, nurses and social workers (Figley, 1995c; Beaton and Murphy, 1995; Boscarino et al., 2004b; Ackerly et al., 1988; Arvay, 2001a; Creamer and Liddle, 2005; Bride, 2007; Jenkins & Baird, 2002) has suggested that individuals can be traumatised indirectly without actually being physically harmed or threatened. There is a fundamental difference in the way or pattern in which a person reacts directly and indirectly during to trauma experience This means that people can be traumatised without actually being physically harmed or threatened with harm. That is, they can be

traumatised by the sheer knowledge of trauma suffered by someone else, who is not necessarily a close relative or significant other. Indeed, The DSM-III in its later version also acknowledged and explained the indirect impact of trauma:

> *Events experienced by others that are learned about include, but are not limited to, violent personal assault, serious accident, or serious injury experienced by a family member or a close friend; learning about the sudden, unexpected death of a family member or of a close friend; or learning that one's child has a life-threatening disease* (APA, 1994: 424)

Pearlman and Saakvitne (1995: 31) described the condition as vicarious trauma, i.e. the cumulative effect of working with survivors of traumatic life event, and anyone who engages empathetically with victims or survivors is vulnerable. Meanwhile, McCann and Pearlman (1990) refer to STS as a set of psychological reactions that mimic post traumatic stress disorder and can be an outcome of exposure to a patient's traumatic material. Overall, the differences are minimal in the literature between secondary traumatic stress and vicarious trauma (Jenkins & Baird, 2002; Pearlman & Saakvitne, 1995a, 1995b).

In managing disaster, Gist and Lubin (1999) recommend mobilising community support and its natural systems to bolster the transitions of those most affected by the event. For example, the clinical intervention. The use of empowerment models and social support in managing disaster other than just using clinical approaches to treatment and intervention is also emphasized (Gist & Lubin,1999). It is also important to set up community-based approaches to information, empowerment, and peer support. This is to ensure that the goal is directed towards mobilising, enhancing and maintaining those natural avenues of social support that typically sustain persons through life crises, and through public health and prevention develop ways in which individual self-efficacy and resilience can be improved as a foundation or root to recovery and growth.

Furthermore, consultation and education centres for sensitisation of the community about the disaster could also be set up. This would help to deal with those elements of community interaction that might benefit from the behavioural science input. Consultation and education also help to restore the community to develop the capacity to embrace the disaster and support the community using available resources. This could be done through public education or public campaigns to bring together different bodies or advocacy groups to create, develop and explore a wide range of approaches. This might help to enhance elements of community social support

systems, which can be used by affected people to effectively manage the disaster and help one another during crises.

There should be media-centred dissemination of information which offers guidance and self-help information in brochure form. In addition, there should be forums and opportunities for those who have experienced crises to share their own experiences of coping strategies and mutual support. If possible, volunteers should also be included to support victims so that they are able to recover or cope with the aftermaths. Setting up groups of professionals such as mental health workers, counsellors, therapists and para-professionals would offer help and comfort. Whoever is ready to help should also be included at some level. In addition, it would be valuable to set up Disaster Mental Health Services (DMHS) and to put in place Critical Incident Stress Debriefing (CISD) procedures especially for response teams (community response team) or emergency workers. Community Mental Health Centres (CMHCs) where individuals who are affected can go for support and relief services could also be set up.

Following a disaster, diverse and comprehensive mental health services are required by all those affected. This needs to be based on a holistic approach, covering the physical, psychological, emotional, social as well as spiritual aspects depending on the nature of the disaster. This involves identifying the people most affected who might need psychological input, and disseminating information about the services available during this critical moment so that they can attend support groups. Psychological approaches should be based on the basic knowledge of human behaviour and social response that can help communities reclaim autonomy and self-efficacy in the face of social disruption. In addition to this, short-term and long-term measures such telephone follow up, hotlines, pamphlets, media, and public meetings to disseminate information need to be set up. Emergency (crisis) counselling, support and crisis intervention need not be set aside. They should be integrated into the management plan as well. Psychological debriefing for emergency workers should not be overlooked as these professionals are most affected by the nature of their work (Mitchell & Everly, 1996).

There is need for structure in the performance and reporting of disaster research and for evaluations of interventions for preparedness and for responses to events. The buffering capacity of the society facing the event is also an important part of the management plan. Related hazards, risks, preparedness for and responses to events all need to be revisited. It is important to integrate disaster management and community planning. Yet current practice seldom reflects such a synthesis, and this is one of the reasons why hazard awareness is absent from local

decision-making processes. If mitigative strategies are to be successfully implemented, the disaster management process must incorporate public participation at the local decision-making level. When public participation is integrated into disaster management planning and community planning, the result is sustainable hazard mitigation (Pearce, 2002).

In addition, assumptions in the face of disaster need to be acted on cautiously as not everyone may look at managing the crises in a similar way. Thus, it should never be assumed that the outside world will see the situation from one's own perspective. Always professionals should ask whether they are solving the wrong problem or the right problem to avoid being blamed (Mitroff, 2001).

For efficient disaster management, there should also be efficient scheduling of disaster management task forces based on timely onsite data. This is important because it helps to minimise problems such as idling of resources due to lack of assignments, and inadequate prioritisation of task forces like the coordination centre. Scheduling also reduces idling of resources because of long-winded coordination process onsite, trying to figure out who will do what and when. This also helps to avoid duplicating work especially if coordination is not well executed. Therefore, to overcome resource scheduling, systems must ensure that task forces are able to act autonomously by providing local scheduling capability. There should also be provision of personalised schedules for task force members that are adapted to their individual situations, based on the coordination centre's global strategy. There should be support for monitoring and logging of the activities of a task force member, dynamic adaptation of his or her personal schedule, and communication to the operation centre for integration into global strategy. Allow for perception and recording of situation facts and requirements by the onsite task forces and for propagation to the operation centre.

According to Mitroff (2001), five major factors in managing crisis need to be looked at while preparing for crisis, managing crisis and managing the aftermath of major crisis. These are: types of crisis or risks, mechanisms, systems, stakeholders and scenarios. The main purpose of this best practice model is to serve as benchmark against which an organisation should measure the current crisis management performance (Mitroff, 2001). It is also advisable not to make a separate programme but rather to integrate crisis management with other programmes. A portfolio that prepares the company or organisation for at least one crisis in each of these categories – economic, informational, physical, human resources, reputation, psychopathic acts and natural disasters – needs to be created. The crisis portfolio need not be limited to just natural

disasters or to disasters specific to one industry. In addition, it is important not to rely on traditional risk analysis as this concentrates only on those crises that have occurred in the past. All the five major factors mentioned above need to be managed, and patterns and interconnections in past crises also need to be looked at. It is also important to generate maps to understand how crises develop and reverberate within and outside the organisation.

In addition, it is vital to consider the effects that one crisis will have on the different categories of crises, therefore one needs to ask whether these categories are likely to generate new crises. Mechanisms which can be used to detect the early warning signs of a crisis need to be set up as well as damage containment mechanisms. At the same time, post-mortems of crises and near misses need to be conducted. However, meetings which assign blame need to be avoided; rather concentration should be placed on improving signal detection and crisis prevention. On the other hand, technology, organisational structure, human factors, culture and top management psychology need to be examined. The ways crises develop from these systems also need to be determined and methods of reducing any error sought. All in all there is also a need to identify what kind of defence mechanism an organisation or country uses to promote denial that they cannot be affected by any disaster or crises.

It is important that organisations prepare for at least one of the type of crises that affect humankind as discussed earlier. Disaster preparedness means that organisations or countries should not only prepare for natural disasters like earthquakes, fires, floods, tornadoes and the like but should also put in place what can be used as precautions, since no one can predict or stop a natural disaster from happening. Organisations or government can ensure that strong buildings with firm foundation are built in order to reduce the effect of events like collapse of buildings which end up killing hundreds or thousands of people. This would help to reduce the number of human components in these crises. Nevertheless, organisations need to also design appropriate recovery efforts for the victims of such disaster as well as their families.

Crisis management or disaster management needs to be done systematically since disaster management itself is strongly systematic. If warning signs are picked up and dealt with effectively, then crisis can be managed or even prevented. If this is not done, then an organisation or government not only makes a major disaster more likely to occur, but also reduces its chance to bring it under control. It is therefore necessary to put in place an appropriate range of signal detection mechanisms, while bearing in mind that one detector might not be appropriate for another category of crisis.

It is also important to look at organisational structure and culture and understand how the various subsystems interact by looking at policies and procedures that govern an organisation's behaviour. Therefore, one needs to identify and assess organisational culture – just like individuals, organisations use various defence mechanism to deny vulnerabilities to major disasters and justify why they do not need to engage in effective disaster or crisis management. For example, organisations and governments tend to deny that certain crises happen to them, that they happen to others and that they are invulnerable to such events. Sometimes governments also think that the impact of such disastrous events are minimal, or they minimise the magnitude of traumatic events and tend to believe that crises or disasters do not happen to organisations or governments with a good reputation. In addition, it is also vital to note that some governments and organisations think that they are too big or too powerful and that they are protected from crises or disaster. For example, the attacks on the World Trade Center caught the Americans, 'the world's only superpower', unprepared for and apparently unaware of such evils existing because of its grandiosity, and they ended up projecting a vision of evil on to Islamic extremists and the Arab world thus helping to groom terrorists who are ready to attack them at all cost.

Good disaster management should involve all the bodies, organisations and response teams, for example, community, state, police departments, fire brigades, armies, and international rescue teams like the Red Cross who can be called upon to help during major disasters or crises. It is therefore important that all these people involved in emergency work develop good working relationships among them for actions to move on smoothly and effectively during the peak of major crises.

Manmade disasters always result from improper human action or inactions, or negligence and lack of heed to warning signals, yet they can be prevented. Information technologies such as e-mail, television and the news media play important roles in the occurrence of major disasters as well as subsequent management.

CHAPTER 2

LITERATURE REVIEW & MINISTRY OF INTERIOR EFFORTS ON RISK REDUCTION

2.0 Risk, emergency and disaster management: Literature review

The United Nations International Strategy for Disaster Reduction (UNISDR) was founded in December 1999 with the mandate to design and assist countries in the implementation of Strategy for Disaster Reduction, DR (General Assembly (GA) resolution 54/219. The UNISDR is now part of the United Nations Secretariat and its functions also span the development and humanitarian fields. Other main areas of its work includes ensuring disaster risk reduction (DRR) is applied to climate change adaptation, building disaster-resilient cities and strengthening the international system for DRR. UNISDR's vision is based on several strategic goals of the Hyogo Framework for Action which integrate DRR into sustainable development policies and hence aims to strengthen institutions and capacities and ultimately build resilience, incorporating risk reduction approaches into emergency preparedness, response, and recovery programmes. UNISDR leads also the preparation and follow-up of the Global Platform for Disaster Risk Reduction (UN, GA resolution 61/198). The Global Platform has become the main global forum for disaster risk reduction and for the provision of strategic and coherent guidance for the implementation of the Hyogo Framework. Other areas of work for UNISDR include issuing the Global Assessment Report on Disaster Risk Reduction every two years, supporting countries in monitoring risk trends and the implementation of the Hyogo Framework for Action, and most importantly leading global campaigns on disaster risk reduction for safer schools, safer hospitals and safer cities. Margareta Wahlström was appointed in 2008 the United Nations Special Representative of the Secretary-General for disaster risk reduction. The functions of this post include leading and overseeing that UNISDR is implemented and/or executed with high-level of advocacy and resource mobilisation activities. As noted, the special representative will also ensure the strategic and operational coherence between disaster reduction and humanitarian disaster preparedness and response activities.

Overall, this chapter will be devoted to discussing international, regional efforts and relevant policy literature on risk reduction and emergency preparedness. The latter includes the efforts of Ministry of Interior (MoI) during the past 10 years with regard to building infrastructure for risk reduction and emergency planning. However, the coverage of this chapter will also include the

concept of disaster versus emergency, impacts of disasters, women and children in disasters, and individual emotional reaction in disasters followed by the notion of pre-disaster management phase, community in disasters, community based disaster management and disaster recovery. The considerable efforts that are made by MoI UAE will be focused on and include the initiation and creation of the highly skilled team in the United Arab Emirates, including the Urban Search and Rescue team (USAR), Geographical Information System (GIS) implementation and the creation of Disaster Management Administration as well as the Disaster Victim Support and Casualty Bureau. The implementation of the GIS was developed to enhance the capacity of command with sophisticated facilities to manage disaster and big events.

Focusing on the regional level, i.e. the Middle East and North Africa, the work of disaster reduction remains – apart from a few countries in the region – in its infancy stage in most of the Arab world. The assembly and inauguration of the first Arab Conference on disaster reduction which was held in Aqaba, Jordan, 19–21 March 2013 (see appendix) was considered the first important event of its kind – though sponsored by UNDP and the Arab League – which was directed at the promotion of a regional risk reduction framework (see the declaration attached); and developing action plans to meet emergency risk resulting from climate change, floods, earthquakes and both natural and manmade disasters. The aim is ultimately to achieve resiliency and develop sustainable communities. The Aqaba final declaration on risk reduction clearly stated that

> *many Arab towns are located in high risk areas, including coasts and highly seismic zones, as well as volcanic areas making them exposed to disaster risk from earthquake, flooding, storms, sea level rise and other related risks.*

Hence the declaration further suggested that sufficient investments in disaster risk reduction activities are necessary to minimise losses, damage and sustain livelihood. It was also suggested in that particular declaration that cities must allocate 1–5% of city annual budget for disaster risk reduction work to be spent on integrating reduction measures in all development sectors. This is to strengthen institution capacities and enhance resilience of infrastructure and improve community preparedness. The declaration also recommended the development of education and training programmes on disaster risk reduction to cover school, universities and the curriculum. It is worth noting here that while many Arab countries have equal commitment to the declaration of Aqaba on disaster risk reduction, many have different capacities and resources to implement the useful outcomes of the declaration.

2.1 Disaster versus emergency situation

The concepts of disaster and emergency are two different situations. An *emergency* is a situation in which the community is capable of coping. It is a situation generated by the real or imminent occurrence of an event (threat) that requires immediate attention and resources. Meanwhile, a *disaster* is a natural or manmade event which causes intense negative impacts on people, services and/or the environment, exceeding the affected community's capability to respond; therefore the community seeks the assistance of international agencies and call upon government's resources.

2.2 Disaster impact

Disasters often leave a trail of destruction behind them. Their impacts are usually felt across all sectors in society, including community, family and individual levels, which can lead to a push for a more multi-sectoral approach to prepare and respond to disasters. The intensity of the impact of any disaster is dependant on the preparedness level of the community or nation. The more obvious physical impact is the socio-economic and emotional impact felt by the community. Factors that increase the intensity of the impact of a disaster are poverty, environmental degradation, population growth, and lack of information and awareness about the hazards that exist in the area, and the potential risk they pose to the community at large. This chapter will further discuss the physical and social impact of disasters. Disasters leave impacts on the basic needs of people, and their livelihood. Thus governments should be prepared so that they can deal with the disaster promptly and effectively. Often, a rapid assessment is immediately conducted after a disaster by government or other focused agencies. The information collected from this quick initial assessment on the damage disaster is used by the leaders of the community or nation to determine whether any external assistance is needed. It is also used to determine 'what and how much relief' needs to be brought in immediately and long-term, and also what specific segments of society have been affected heavily by the disaster. The impact intensity felt by a community from a disaster is dependent upon the vulnerability of the community before the hazard struck (e.g. proximity to hazard, public awareness of the hazard, etc.) and thus their preparedness level.

In any community the most obvious impact is the physical impact. The physical impacts in turn lead to the social impacts felt by the community. These are described further below. Indeed, the physical impacts of disasters will include death and injuries and damage to property,

infrastructure and the built environment. It should be noted here that the amount of physical damage caused by a hazard can affect the speed at which the response to the area can occur. If roads are cut off, this means alternative means need to be looked at to bring relief in to the disaster zone. Of the many components of a country's infrastructure, a select few are vital to both disaster response and to overall safety and security of the effected population. These components are referred to as 'critical infrastructure'. While all infrastructures damaged or destroyed in the disaster will eventually require rebuilding or repair, critical infrastructure problems must be addressed in the short term, while the disaster response is ongoing. The repair and reconstruction of critical infrastructure requires not only specialised expertise but also equipment and parts that may not be easily obtained during the emergency period. However, without the benefit of certain infrastructure components, performing other response functions may be impossible. Examples of critical infrastructure components include the *transport system (land, sea and air)*. This system is important because at the time of disasters there needs to be an evacuation route available so as to get people out of the danger zone and/or bring relief in. Transport is also important when a team needs to be sent into the disaster zone to carry out a rapid assessment exercise. Other critical infrastructure includes *gas and oil storage and transportation* connected to transportation above. Evacuation may take from a couple of days to a week, and so extra fuel and oil are needed for the cars, boats, helicopters, etc. that will be transporting people out. *Communication* is a critical factor because before a disaster and in the event of a disaster communication is needed. It is needed to get information out so that the outside 'world' knows what is needed and can respond appropriately. Other components of the critical infrastructure are *electricity, water supply system, sanitation and public health*. All of the latter provide the basic services needed by the people and community and can affect the lives of people in the short term.

Today, security has become an important factor that has been mainstreamed into the action plans of many disaster planning offices. Security is the condition of being safe from harm, danger or loss. Security can be either emotional or physical security. Physical security is any and all necessary requirements that once implemented are designed to prevent, deter, inhibit or mitigate threats that endanger the safety and security of persons and/or property. Safety and security in disasters differ by the fact that safety provides for the reduction of the risk of occurrence of injury, loss or death from accidental or natural causes. Security on the other hand provides for the reduction of the risk of occurrence of injury, loss or death from the deliberate or intentional actions of man and natural causes. Usually when disasters or an emergency situation arises, various

security issues will arise such as *looting of retail outlets and business houses.* Disaster situations can provide an ideal opportunity for people to go looting. If no preparation in this area has been made, when the disaster strikes, most of the resources are being used to evacuate people. This leaves businesses, houses retail shops left unattended and vulnerable to looting by those looking for the opportunity. Looting takes place because of the fear that authorities will not take care of their needs, and so people find ways to take care of themselves and their families. Focusing on *security of women and children* in disaster, when there is lack of security and a poor level of preparedness, women and children are vulnerable to attacks of violence or rape, or even to exposure to the primary hazard (fleeing to a more dangerous zone). This may be due to lack of preparation or knowledge or panic. Violence or rape is more likely to occur when there is a poor evacuation process, and when families have been separated from each other. And when women and/or children are isolated from the security of their families. It is also more likely to arise in overcrowded care centres and when evacuation centres lack security. It should also be acknowledged here that women and foreign care workers participating in relief effort and/or humanitarian care, who are flown into the war zones or disaster sites to assist in the response to the disaster may also be vulnerable and require necessary protection against shock, distress, secondary trauma or violence and rape.

Overall, in disasters (manmade and natural), evidence suggests that the impact disasters leave on the community or individual varies. It is easier to witness the physical injuries of disaster – including death and displacement – than invisible psychological trauma. Victims of disasters are required to adapt to sudden changes in their daily routine and life, and thus need to be resilient. Preparedness for disaster helps in such circumstances and can reduce the emotional and mental impact of disaster on individuals, families and community. Hence, there is a need for trauma counselling services operating in high risk areas, as well as the need to consider or put in place welfare services for those severely impacted by disasters.

Focusing on emotional and mental well-being and needs, a wide range of common reactions to trauma have been reported in the literature including anxiety, depression, sadness, confusion and lack of concentration. Victims of disasters and survivors may also experience nightmares, lack of sleep and lack of social interaction. Other reactions to trauma may be nausea, loss of appetite and fatigue. Recovery may take time and depend on the losses and the nature of circumstances surrounding the survivors. In the immediate aftermath of disaster events, many family members

and children encounter problems that are not easily solved. Some of the concerns confronted by children include inability to sleep, fear of the dark and unexplained fear, low self-confidence, challenging behaviours, inability to concentrate, and poor school achievements alongside other post traumatic stress reactions. Post-traumatic stress disorder (PTSD) is a psychological reaction that can result from experiencing or witnessing an overwhelmingly traumatic (near death experience) or event. PTSD may manifest months or even years later and include the following symptoms: school refusal, fear of separation from parents, repetitive play in children, clinging behaviour, unexplained and persistent fears related to the events, sleep disturbances, nightmares, bedwetting, concentration problems and physical complaints (stomach aches, headaches, dizziness) for which a physical cause cannot be found as well as poor social interactions with friends and others.

Professional advice or treatment for children affected by a disaster – especially those who have witnessed destruction, injury or death – can minimise PTSD reactions and normalise behaviour. Parents and school teachers can identify the manifestation of the above indicated symptoms and report them to professionals working with children including school counsellors and/or local health authority.

2.3 The disaster management concept

The disaster management cycle is a continuous process which may include several linked stages. These include mitigation, preparedness, response, and recovery. Mitigation refers to those measures that have been taken and policies put in place to reduce the impacts of a disaster. The process involves hazard identification, vulnerability analysis, building infrastructure and ensuring availability of up-to-date logistics. Proper education and public awareness are useful tools to engage community involvement. Disaster can both destroy development initiatives and create development opportunities. Effective mitigation programmes incorporate risk reduction measures in regular investment projects.

Mitroff (2001) who discussed disaster management suggested that disasters are now part of the very fabric of modern society. Although all crises cannot be foreseen or prevented, all of them can be managed effectively if only we understand and use best practice to manage them. Manmade disasters now override natural disasters in magnitude and scope, yet it is unfortunate that most institutions or countries do not anticipate such crises nor do they design or put in place management strategies that can effectively be used to manage and prevent them. In addition,

there are some things that need to be in place before any crisis occurs. These include health information regarding the type of emergency, knowledge and skills needed for preparedness and response, and standardised methods and exchange of knowledge. There should also be strong partnership and collaboration between organisations, experts and disciplines for capacity building. It is important that preparation is done simultaneously rather than preparing for one type of disaster and realising that another has occurred. In fact, if an organisation does not prepare for any kind of crises until it happens, then the impact on such an organisation might be overwhelming such that it is unable to cope or recover from that particular type of disaster and might destroy such an organisation or nation (Mitroff, 2001). Therefore, it is important for an organisation or government to prepare for each individual crisis that is selected as part of the crisis portfolio and they must also attempt to prepare for simultaneous occurrences of multiple crises. This could be done by reflecting on past experiences, looking for patterns and interconnections between past disasters and predicted ones which are yet to occur. Nations or organisations have to anticipate the unthinkable so that when crisis occurs, they do not become paralysed by its occurrence. If this is done effectively, it will help an organisation, community or nation to recover much quicker from the aftermath of such anticipated crises.

Therefore, in pre-disaster management it is important to have signal detection, to identify early warning signs, however small they may be, especially for mass shootings in which individuals post messages on the internet like the Virginia Tech shooting in 2007. While attempting to identify early warning signals of imminent disaster, it is important not to deliberately block any signal that would alert organisations or government to an impending crisis, nor should warning signals be ignored and all lines of communication should be kept open. In addition, it is important to make good use of signal detection mechanisms that are already in place as this minimises the cost of installing new ones. It is important also to use mechanisms that can search for signals from all types of crises and this should be directed internally and externally, attuned to both technical and people warning signals. There should always be someone identified and dedicated to blow the whistle or sound an alarm should there be any imminent threat of an event. A clear reporting sequence need to be put in place such that people are aware of steps to take in the event of any crisis. (Mitroff, 2001: 102).

Another example of the lack of pre-disaster management is the recent oil spill in the Mexican Gulf. The company British Petroleum failed to take seriously reports of possible pipe leakage; it is one of those areas where reports are never taken seriously by the managers. This led to a more

serious situation than should have occurred since it was possible to carry out repair works and good monitoring of the oil plant or even employ more professionals, using cost effective measures. What were the executives doing? Why wasn't this possible leakage identified before the disaster and dealt with at an early stage? Only after it destroyed the ecosystem of aquatic animals human lives and received criticism from all corners, did the company take the problem more seriously.

Overall, while we cannot prevent disasters from occurring, much can be done to reduce the likelihood of severe impact. Through thoughtful planning and the establishment of a disaster prevention and response team, nations can avert many crises and be prepared when they do occur. Governments over recent years have formulated strategies to cope with, prevent and mitigate disasters. These policies often consist of long- and short-term prevention and preparedness measures including immediate response mechanisms. Post-disaster measures and recovery activities continue until all systems return to normal or better. Recovery measures, both short and long term, include returning vital life-support systems to minimum operating standards; providing temporary housing, public information, health and safety education; counselling programmes and services including data collection related to rebuilding; and documentation of lessons learned. Recovery activities are classified as short-term and long-term. During response, emergency action is taken to restore vital functions while carrying out protective measures against further damage or injury. A short-term recovery is immediate and tends to overlap with response. The authorities may restore interrupted utility services, clear roads, and either fix or demolish severely damaged buildings. Additionally, there may be a need to provide food and shelter for those displaced by the disaster. Although called short-term, some of these activities may last for weeks Long-term recovery may involve some of the same activities, but it may continue for a number of months, sometimes years, depending on the severity and extent of the damage sustained. For example, it may include the complete redevelopment of damaged areas. The goal is for the community to return to a state that is even better than before the emergency. This is an ideal time to implement new mitigation measures so that the community is better prepared to deal with future threats and does not leave itself vulnerable to the same setbacks as before. It should be indicated here that helping the community to take new mitigation steps is one of the most important roles during the recovery phase. The following section will introduce the various preparedness measures taken by MoI UAE for risk reduction and efforts made for capacity building and emergency infrastructure development. These include the implementation of GIS technology, the creation of a Crisis and Disaster Management Department and the

development of a UN recognised Search and Rescue team alongside other emergency operating services and initiatives.

2.4 The recognised need for emergency and disaster management initiatives at AD Police GHQ

2.4.1 GIS technology in the command and control room (C2)

This section will provide an overview of the application of the Geographical Information System (GIS) in the command and control room C2, and the whole notion of emergency, risk reduction and crisis management services in Abu Dhabi Police. This includes the main strategy of emergency operation and disaster response, resources, partnership and key recommendations of the main applications. Abu Dhabi Police first used digital mapping to visualise the location of police patrols using automatic vehicle location system (AVLS) in the late 1990s at one of its command and control sites. In 2006, the GIS branch was established in the central operations department to provide mapping, location, and spatial information capabilities to the C2 environment and systems. One goal was to support emergency calling centre 999 with the ability to identify the location of the caller and map it using the triangulation method of cell location and mapping on a GIS system. Other goals were:

- To provide the C2 officers with a visualisation tool of satellite imagery, high resolution orthophotos of urban locations in the city of Abu Dhabi.
- To provide C2 system with gazetteer data of geographic locations in Abu Dhabi, in order to ease the process of searching for specific places and landmarks.
- To create basic functional GIS layers for the purposes of C2.

The GIS branch at central operations also provides analytical assessment on specific areas of concern to police and public safety officers. It can provide the spatial relations between objects in the same geographical area, as well as between different geographical areas. Since its establishment, it has provided situational awareness maps of the criticality of the location to other branches. It has been responsible for risk assessment, risk reduction and contributes a great deal to the management of big events; and acts as a support team to crisis management officers in the C2 environment at ADP.

The GIS officers at the branch play vital roles in the intelligence information cells at times of crisis and big events; they were often tasked to gather, capture and map information that has spatial

context. Their task is to provide commanding officers with specific satellite imagery and orthophotos of the affected area of crisis and emergency concerns. Also their duty requires mapping the log of the emergency incident/crisis as time passes, and to provide both vector and raster maps to the command officers instantly. In addition, all police and public safety ground/field units are served with mapping field data, as well as map plotting services at the GIS branch at ADP.

In 2008, a strategic road map was created to provide enterprise geo-services to all police business domains putting in place a systematic methodology to integrate the forces' legacy systems, including the C2 system and AVLS. Meanwhile in 2009, the GIS branch assisted the operations department (C2) in the process of building technical and functional evaluation criteria and assuring governance of IT and GIS standards in the process of procuring a GIS based solution for crisis and disaster management teams. Later in the year, Abu Dhabi Police signed a contract with a Canadian firm called 'EmerGeo' to equip the force with:

- portable GIS based device for mobile silver and bronze teams (MLP EmerGeo);
- a Web based GIS based solution that could be accessed across the police sites and civil defence stations within any geographical police directorate and jurisdiction via the intranet (internal police network);
- linking different data sources (C2, AVLS, GIS datasets) and sensor feeds (CCTV) based on the location of the event/crisis;
- storing and querying contingency and security plans/documents for large-scale emergency events and disasters in a single database;
- training courses for IT personnel, GIS professionals, first line C2 managers, and support teams for both Gold and Silver commanders.

The system was installed and configured during the Formula 1 event at YAS Island and Youth Football World Cup at Abu Dhabi in 2010 and 2011 and integrated into all major events afterwards, and was fully functioning with the Ministry of Interior, GIS Centre for Federal Safety and Security.

It is worth indicating that Abu Dhabi Police GHQ is the first and only country in the Arab world to recognise the significant importance of GIS mapping and location systems that apply to emergency, crisis and disaster response; and also its value to other police business such as crime and crime scenes, geographical profiling, protection, allocating/reallocating of police

resources in both emergency and security. Due to the importance and usefulness of GIS to the core business of police in emergency and safety H.H. Lt. General Shaikh Saif Bin Zayed Al Nahyan, the UAE Deputy Prime Minster, Minister of Interior, issued a decree to establish the GIS Centre for Security with mandate and organisational structure linked to the General Directorate of Central Operations in ADP. The decree demonstrated the commitment of the UAE Government to local and international emergency, risk and disaster management. Though the UAE Search and Rescue team has already assisted and contributed to many relief efforts as a result of major disasters, the main strategy behind the creation of the GIS department was to enhance the capabilities of command and control room C2, and equip the Gold/Silver crises rooms with sophisticated capabilities to manage disasters and big events. The service has now reached each police station, civil defence departments and fire brigades.

Focusing on staff resources utilised in emergency and disaster management, as indicated earlier ADP formed a chain of command hierarchy for managing major emergency events, crises and/or disaster. Gold commanders were named and support teams of specialised officers identified and hence linked to each of the Gold commanders' area disposal, in the Gold command room. Silver commanders in each police business vertical and horizontal domain, from each region in the Emirate were also appointed to contribute to the specialisation. Bronze commanders in each police station jurisdiction were also linked and identified.

In order to support this hierarchy, and continue to facilitate the C2 environment with specialised professional geo-services, ADP recruited GIS professionals and experts to support both the Gold and Silver levels. It has made GIS professionals an integral and essential part of the crisis and disaster management and response team.

Human resource and GIS capability building (fig 1 below) are still important issues within ADP. This is important to being fully and professionally prepared for emergency and/or big disaster events. It is worth indicating that all capability building efforts of emergency management are focused on training ADP personnel; and provide knowledge transfer to all sub-specialisations (i.e. to all admin staff, IT operators and GIS staff).

Still focusing on GIS and responding to emergency and disaster, below are some details on the main stages of the call handling and emergency response service. The location of the emergency call is first identified on the maps as x–y and coordinated via Web-service using a
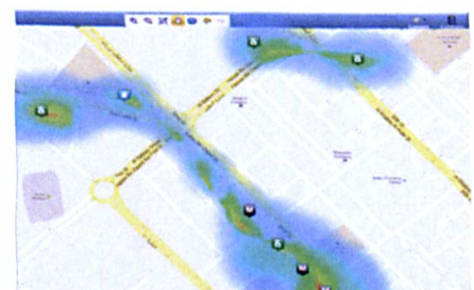
cell triangulation method from the telecommunication provider. If the location of the emergency incident, crime or accident is different from the caller's location, the call taker uses the GIS gazetteer data to identify the valid geographical address where resources should be sent to. This maps the call's locations on both the call taker terminal, as well as the dispatcher/event manager consoles on both vector and raster digital GIS maps and imagery that are stored within the C2 system.

Then the dispatcher visualises the location of the closest relevant available resources (e.g. ambulance, fire-fighter, rescue units, police patrol, special task units, etc.) from the C2 map viewer that holds GIS data, and dispatch. Officers in C2 then use GIS layers to locate and search for points of interest (POI) such as schools, hospitals, police stations, fire hydrants, etc.

It is also important to note that the GIS centre for security produces periodical geo-analytical reports to C2 management, which illustrate the clustering of incident location data through hotspot maps. In addition, it analyses the relationship between police resources' locations and incidents' locations. The analysis takes into consideration off-peak and peak periods (hrs/days/months/seasons), which are used to enhance response times and reallocate resources based on demand represented in the Hot Geographical Zones.

Indeed, situational awareness maps used for crisis and disaster management are considered to be powerful visualisation and analytical tools for Gold, Silver and Bronze commands. Capturing field data and mapping them immediately provide better informed decisions that are made in both the command and control room, as well as the crises rooms at police premises and field mobile command units stationed close to the event's site.

Figure 2: Situational awareness map
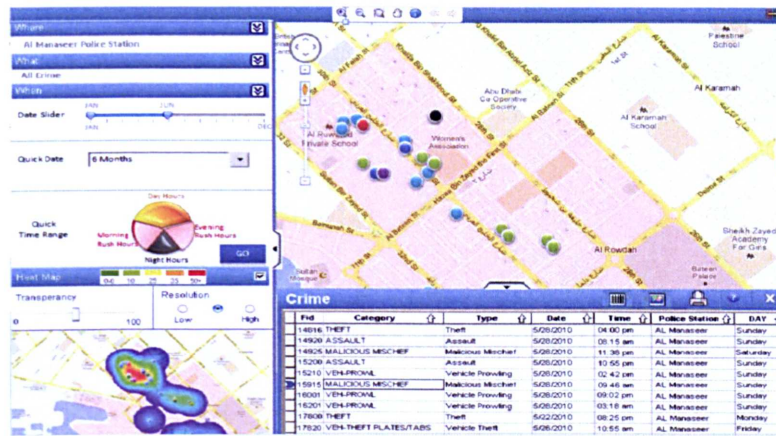
Overall, GIS plays a vital role in the planning phase, prior to a major event or crisis. Maps of various risk locations considered to be critical sites are always produced and published for assessing the impacts of probable threats whether they are manmade or natural disaster threats. Map services both pre-made and post-made of the relevant needed field data are always provided both in an electronic format (map Web services) and in hard printed copies and maps. This assists the decision-maker to understand the situation before the disaster occurred, and monitors the changes at that location and integrates locations as time passes.

Figure 3: Geo-plume modelling in the EmerGeo system
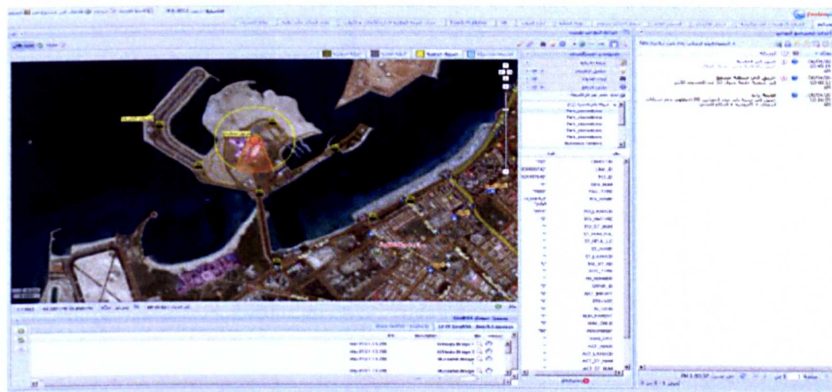
Additionally, GIS provides a common operational picture of all activities taking place at specific area(s) of concern, and tracks movements of objects and resources available on the ground from different perspectives. It fuses all data and information that has a location extent into a single map window to form a common operational picture (COP) of the crises/event.

Figure 4: GIS common operational picture
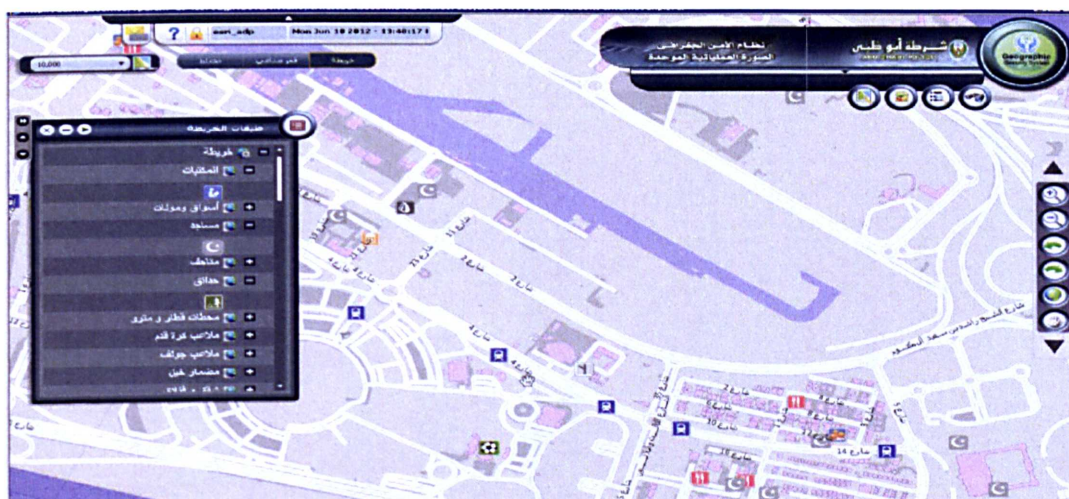
Moreover, the usefulness of GIS can be extended to 'HAZMAT teams' who deal with hazard materials of chemical, biological, radiological or nuclear (CBRN) nature, with the capability to determine the risks and impacts on that specific area. It calculates the spreading ratio and direction which provides the ability to take precautions when dealing with such materials. It combines the metrological data with the characteristics of the hazard material and its relation to the terrain and landscape (characteristics of the location); thus, crisis managers get better understanding of the risks facing the HAZMAT team on the ground and are better prepared for action plans such as evacuating an area.

Figure 5: CBRN modelling in geographical extent
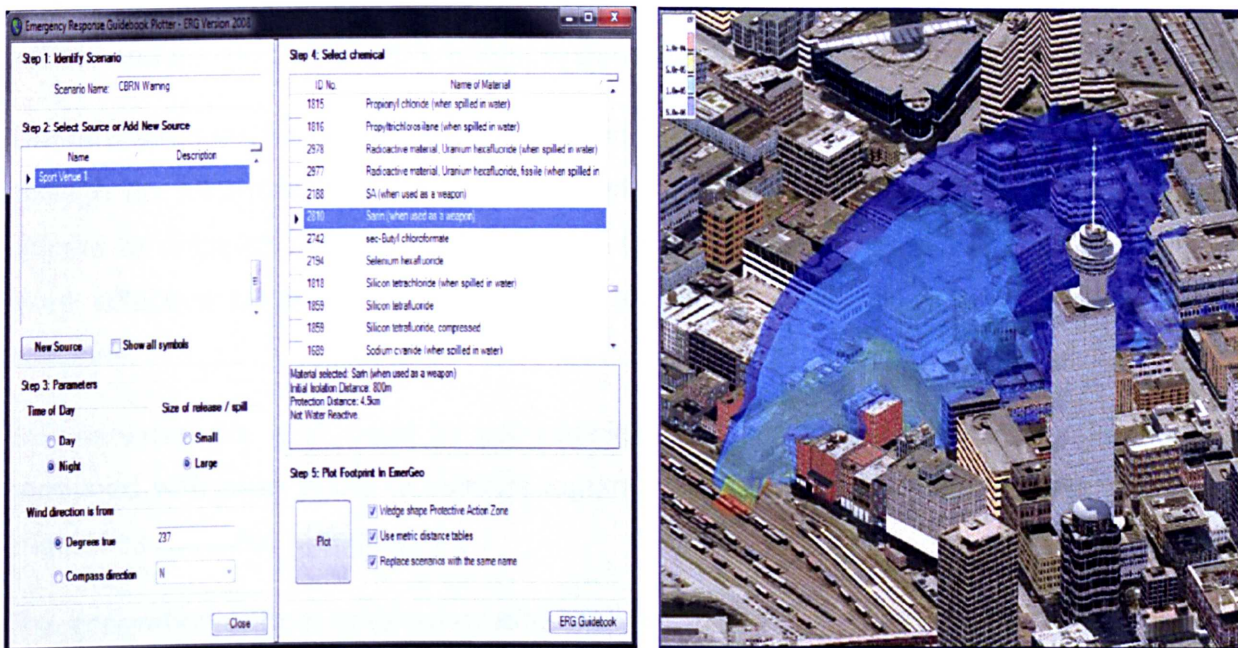
Figure 6: Web GIS based crisis & disaster system (EmerGeo)
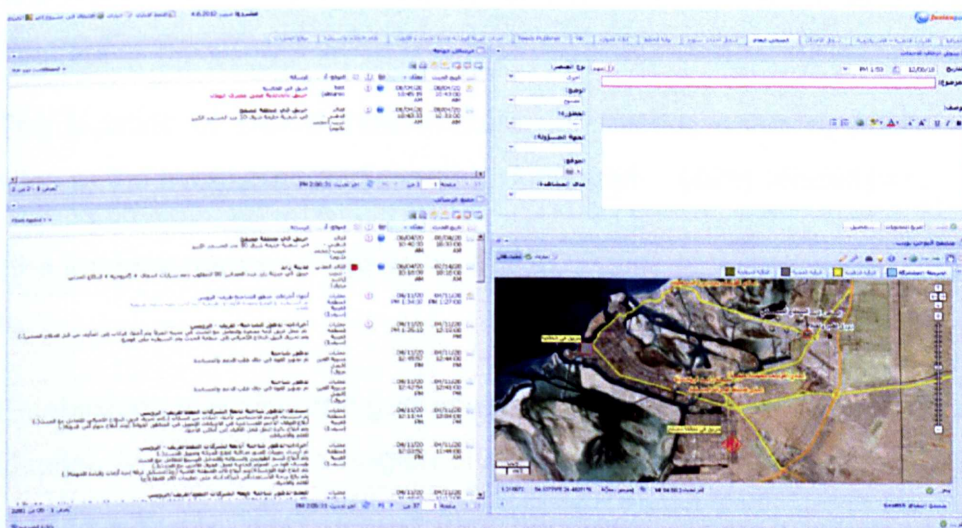
2.4.2 Summary of GIS services implemented at ADP GHQ

The GIS service combined with the gazetteer capabilities are used to find the location of emergency 999 calls, dispatch the nearest responders and identify nearby landmarks like hospitals and critical sites. This service dramatically reduces the response time and eliminates

manual descriptive guidance from the caller. Search and rescue areas are reduced to a directional radius of 50m–10 km rather than having to rely on wide area search using police patrols and air wing units (helicopters) in desert areas where no landmarks can be provided.

The GIS services fulfilled the need for locating police resources and responders on digital maps through an automated vehicle location system in order to support command and control (C2) officers to dispatch the nearest responder to the incident location. The response time became more effective because the C2 officers are 'location-aware' of the incident and responder positions.

GIS services are also used to geographically analyse incident locations to identify hotspots combined with peak hours of incident logging which has led to scientific task force management and police resource planning.

The integration of both emergency and crisis management system and the GIS services provided the capabilities of visually mapping:

I.   The location of the incident identified as important, the police vehicles at the event and its surrounding area.

II. The location of police surveillance cameras with the ability to stream videos directly from the map.

III. The location of critical infrastructure, landmarks, schools, public areas and evacuation sites at the event area and possible contingency plans related to it.

Overall the implementation of GIS within the AD Police emergency infrastructure resulted in the following:

- Establishing mapping and geo-analysis units in each police geographical directorate (AD Capital, Al Ain, Western Region of AD Emirate, External Region of AD Emirate).

- Linking different directorates in each geographical directorate in a shared network centrally to the security spatial data centre in Abu Dhabi, as well as to a DR site 150 km from the main site to ensure availability of the geo-services.

- Providing professional geo-services handy and ready in each directorate to reduce time, effort and costs, transferring requests and personnel from/to the main GIS Centre for Security located in Abu Dhabi.

- Facilitating police directorates with modern sophisticated GIS/ITC equipment.
- Producing operational, situational, and ordinary maps on daily bases in each police directorate.
- Creating awareness and importance of training sessions on GIS.
- Consolidating the reporting documents and presentations about main KPIs, targets, and situational statistics, between C2 rooms and crisis or disaster rooms, and the GIS analysts.
- Providing QA/QC on incidents' coordinates as a feedback report for validation and sustainable improvement.
- Providing police commanders, officers and personnel, better understanding of community problems and hotspots/hot zones in each location in the Emirate.
- Providing faster response to hot zones or hotspots.
- Providing better allocation and reallocation of police resources on the ground based on information about demand and hotspots.
- Enriching the Ministry of Interior in the UAE with police relevant data on crimes and accidents.
- Geo-enabling crisis and disaster systems (EmerGeo) with map service and location codes of areas.
- Providing better knowledge of where to install surveillance equipment and monitoring devices in each location that has high rates of probable threat occurrence.

2.5 The creation of the Crisis and Disaster Management Department alongside the UN recognised Search and Rescue team

2.5.1 Introduction

As noted elsewhere in this chapter UNISDR, the emergency crisis management infrastructure, is an essential part of planning for safe, secure and stable nations. It is also the first priority of Abu Dhabi's 2012–2016 strategic plan. It should form the bedrock by which all responsible agencies and authorities within a country prepares for, or prevents major incidents, including both the way it responds to such incidents and the way in which it recovers when an incident has occurred (UNISDR, see also Aqaba declaration attached).

The identified needs for the Emirate of Abu Dhabi to be prepared to manage any crisis, whether natural or manmade, is similar to the need for each and every country in the world. However,

there are some factors which other countries may not have as deciding factors when planning for all possible crises.

While assessing the current position of Abu Dhabi Police in crisis management and preparedness, it is worth highlighting the major infrastructure development of the United Arab Emirates in recent years.

The UAE is a relatively young nation; on 2 December 2012, the country celebrated its 41 anniversary. The UAE is still a young country in many respects, but it has had to learn fast due to its geographic location and the vast oil reserves that the country has, particularly within the territorial borders of Abu Dhabi. The native people of the UAE have a long and strong history combined with a strong cultural heritage.

The UAE sits in a highly strategic geographic and political position within the Middle East. It has land borders with the Kingdom of Saudi Arabia and Oman and sea borders with Iraq, Iran and Pakistan. The strategically important sea passage, namely the Arabian Gulf or Straits of Hormuz, is close to the territorial waters of the UAE. A total of 35% of all seaborne oil tanker transportation worldwide occurs through this waterway. In addition, the UAE is fast becoming a major aviation hub between Europe, the Far East and Australasia, with tens of millions of air passengers travelling through the main airports of Abu Dhabi and Dubai on an annual basis.

Whilst there is little in the way of recent natural disasters, there is an earthquake fault line running from the northern shores of the Arabian Gulf southwards and very close to centres of habitation for six of the seven Emirates. The UAE can and does suffer from extreme weather conditions, mainly high temperatures and sand storms, but has also experienced very bad rain storms. The most recent was cyclone Gonu which occurred in June 2007 and affected the eastern coastal strip of the UAE.

Abu Dhabi is one of the seven Emirates which make up the (UAE). It has the largest land area of the seven Emirates and it is also the capital of the UAE. The UAE total population is a little over 7 million with estimated 85% expatriates. The proposed growth indicated in the Abu Dhabi Government's 2030 development plan indicates that the population will potentially double in size by 2030.

Abu Dhabi houses important offices of the Federal Government. It is home for the Abu Dhabi (Emir). The head of the family is the current President of the UAE, His Highness Sheikh Khalifa

Bin Zayed Al Nahyan, the eldest son of the late Sheikh Zayed bin Sultan Al Nahyan (3 November 1918–2 November 2004). The late Sheikh Zayed is regarded as the principal driving force behind the formation of the United Arab Emirates (UAE). He was himself the emir (ruler) of Abu Dhabi emirate and first president of the UAE, a post which he held for over 30 years (1971–2004).

Contemporary Abu Dhabi has grown in the last 20 years to become a very cosmopolitan Emirate. It has seen rapid development and urbanisation, coupled with the relatively high average income of its native population. This has transformed the country to become a destination of choice for expatriate workers from across the globe. At present, the city hosts major and global commercial, sporting and industrial events. It has also become a major cultural and commercial centre due to its position as the capital. Abu Dhabi alone generated 56.7% of the GDP of the United Arab Emirates in 2008. Due to its geographic position and mineral wealth the Emirate is well known to many governments and corporate businesses.

As noted, Abu Dhabi currently hosts many events which take place throughout the year. The need to provide a safe and secure environment for such events has prompted the development of procedures and processes to meet the increasing demands upon resources. There is continued support from the higher authorities, which is essential in ensuring Abu Dhabi is prepared to meet all emergency demands that may be placed upon the professional services.

The desire to have a safe and secure country is clearly articulated in the visionary statement made by His Highness Sheikh Khalifa Bin Zayed Al Nahyan, President of the UAE and Ruler of Abu Dhabi as follows:

The Emirate of Abu Dhabi will continue to work towards its own comprehensive, multifaceted vision. That vision is to continue to create a confident, secure society and to build a sustainable, open and globally competitive economy.

The global impact of events is very similar in any country. Any country or state that hosts an event which draws worldwide media attention and attracts many tens of thousands of visitors will have additional demands placed upon it. If the events are managed to a high standard, and are safe and secure, it demonstrates the positive aspects of the host country and brings benefits. Positive impressions will increase the number of tourists to the country, not just those who may attend the subsequent events but people who may have been impressed with the way the nation promoted itself. The regular images of high profile events being staged successfully reach millions of people around the world in a manner more effective than any advertising campaign

could hope to achieve. Indeed, Abu Dhabi Government has delegated the responsibility to Abu Dhabi Police to plan and create a safe and secure environment for the entire UAE society.

2.5.2 Focusing on the strategic priority of AD Police: the notion of safety and professional security

Abu Dhabi Police had for many years been developing and testing a range of plans to deal with major emergency incidents. Each plan was seen as a professional response to crisis and/or disaster management. In addition, all other governmental agencies and departments were also producing plans for their own area of responsibility. This was good for each entity but there was little communication at the planning stages between agencies and as such there was little coordination in planned response. Having said this, Abu Dhabi Police is regarded as unique in relation to the rest of the world in the implementation of emergency service and delivery. Most of these services (blue light services) come under the command of Abu Dhabi Police. Therefore in responding to an emergency many of the potential areas for confusion or conflict that concern primacy of command and control issues experienced in many other countries do not apply.

History has proved on many occasions that if agencies responsible for crisis management do not communicate at an early stage in their planning, when they do come together at the time of a disaster, there is often confusion of role and direction, with a subsequent negative impact upon those who suffered the disaster. Although there had been much planning for natural disasters in the United States of America, when Hurricane Katrina struck the country, the initial response and coordination was found to be inadequate and resulted in a delayed response to the challenge of such a devastating incident. The lessons learnt from this incident and others, together with analysis of incidents that have occurred have been identified and integrated within the preparedness phase and across all teams responding to a major incident in Abu Dhabi.

Focusing on nationwide coordination and emergency response, international benchmarking on good practice for crisis management was conducted in 2007. As a result a comprehensive recommendation report was made to the higher authorities. This resulted in the formation of the National Emergency Crisis and Disasters Management Authority (NCEMA). This was a new organisation with responsibility for planning matters, not the least of which was to produce and publish a National Response plan. The National Response Plan was later developed.

In early 2008, it was announced that Abu Dhabi had won the right to host major international sporting events including Formula 1 Grand Prix racing. The first race was held in November 2009.

That was eighteen months after the main announcement made on launching Formula 1 Grand Prix racing in Abu Dhabi. It was clear that if the event was to be a success much planning was required and the multi-agency work would be immense.

The site chosen on Yas Island was at that stage a clear and 'virgin' desert island with little or no infrastructure to support the Grand Prix. It was to be a total new build area. Not only was there the build programme for the Grand Prix circuit, it was to include new hotels, business premises and residential accommodation. It was decided that all aspects of security from preparedness and planning, to response and post-incident recovery were to be considered from day one.

As a result in early 2008, the Higher Security Council formed the Abu Dhabi Events Security Committee. The Committee was to encompass a 'One Team' approach to the management of the Grand Prix. The lessons learnt during the planning for the Formula 1 Grand Prix identified a number of areas where Abu Dhabi Police could further enhance its ability to produce, test and exercise plans and contingencies for all types of major incidents.

The proposal that established the emergency, Crisis Management and Disaster Department identified specific tasks and allocated overarching responsibility for all aspects of planning and preparing for a major incident. This work would include all internal and external stakeholder liaison and coordination. The former task is now a requirement placed upon NCEMA, but this is in relation to the coordination for a federal response to crisis. In addition this authority is seen as taking a supporting role to the regular first responders from each of the Emirates. The human resources within NCEMA are highly trained and competent, but are limited in number. The proposal put to H.H. Sheikh Saif, Deputy Prime Minster and Minster of Interior, included the need to create a new department which would complete, as a minimum, the tasks of ensuring preparedness, prevention, response and recovery from a major disaster. It would do this by defining procedures and resource requirements, ensuring clearly defined roles and responsibility. It would also ensure command and control procedures and technical assets were in place, each capable of supporting the operational needs of commanders and responders.

There were many issues that needed to be covered (and were included) during the implementation and before a new and dedicated department could emerge. However, the two areas which need highlighting at this stage are:

(i) The task of providing an overarching quality assurance provision for all planning, training and exercising, within Abu Dhabi Police.

(ii) The task of managing partnerships and multi-agency preparedness and working practices to ensure a coordinated response.

After several presentations and consultations made to the senior command of Abu Dhabi Police and ultimately to H.H. Sheikh Saif – at each stage of the consultation process the proposal was refined and amended – eventually the proposal to introduce a new Crisis and Disaster Management Department met the requirements of the Emirate of Abu Dhabi and an official Ministerial Decree No. 28/2012 was issued to establish the department at Abu Dhabi Police GHQ (see appendix).

2.6 Concluding remarks

The signing of Ministerial Decree 28/2012 has set the requirement upon Abu Dhabi Police to be the overarching entity with primary responsibility to coordinate all planning and associated activity towards ensuring Abu Dhabi Emirate is best prepared for any crisis or disaster. Whilst the decree is quite specific about what is required, further work will enhance the capabilities of the UAE in this area. As with any planning model throughout the world, the introduction and the planning will remain dynamic, and will have the flexibility to meet new and unforeseen challenges. Many of these challenges have been highlighted in the Aqaba declaration (attached) and UNISDR principles. The need for Abu Dhabi to provide mutual support to the other six Emirates and in turn for them to support Abu Dhabi in the event of a major incident is fully recognised. It is hoped that the work conducted so far by the United Arab Emirates on emergency planning will meet the UN request placed on nations to respond to the implementation of disaster reduction measures.

Before ending this chapter, it is important to highlight briefly the work of the UAE Urban Search and Rescue (USAR) team at Abu Dhabi Police GHQ. The USAR team's main work is dedicated to international emergency response in disasters. The home of USAR is the Abu Dhabi Police Emergency and Public Safety Administration.

2.6.1 The United Arab Emirates (UAE) Urban Search and Rescue (USAR) Team, ADP

Abu Dhabi Police Emergency and Public Safety Department maintains a dedicated overseas Search and Rescue team. The UAE USAR is an elite team highly skilled in Urban Search and Rescue (USAR), with competencies in height and confined space rescue operations and major road traffic and industrial accident rescue. The team is dedicated to providing assistance to countries hit by a major disaster. The team is self-sufficient in terms of food, fuel and equipment for a working duration of 7 days. Since 2005, the UAE USAR team has responded to several

overseas missions. As standard operating procedure (SOP) requirements, the Abu Dhabi Police Emergency and Public Safety Department can activate its UAE USAR team to arrive at the designated area within 8 hours of activation. The team consists of 53 highly specialised and trained individuals. The members of the team are placed on 24-hour standby for response to any humanitarian rescue mission. As indicated, the team can be deployed for USAR and medical assistance and is self-sufficient for up to 7 days as required by a medium USAR team under the INSARAG guidelines. The UAE USAR team comprises the five key components as required by INSARAG guidelines: management, logistics, search, rescue and medical. The UAE USAR team may come to know of any major overseas disaster via its 24/7 surveillance process or receive a request from the United Nations (e.g. UNDAC alerts) or its agencies. The team will then assess whether there is any scope for activation of an overseas mission, and provide the General Director of Central Operations and Ministry of Interior with an assessment report on whether the activation of the UAE USAR team is recommended. The Ministry of Foreign Affairs and in consultation with Ministry of Interior may request the activation of the UAE USAR team to provide specific countries with required assistance. Further the activation of the UAE USAR team could be triggered by any disaster, natural or manmade, with reports of widespread damage to properties and large-scale loss of lives and injuries that may be beyond the ability of the government in the affected country. This includes, but is not limited to:

(a) earthquakes (of at least magnitude 6.0 on the Richter scale);
(b) typhoon and hurricanes; and
(c) mudslides and floods, etc.

The majority of disasters monitored and assessed by the Abu Dhabi Police GHQ Operations Room may not require the activation of UAE USAR. Thus the Ministry of Interior will normally not be informed of Abu Dhabi Police's internal deliberations unless such disasters satisfy a decision-making trigger. The alert system procedures within the UAE USAR team can be seen in the appendix attached.

Table 2.1: Composition of United Arab Emirates Urban Search and Rescue team

S/NO	DESIGNATION	COMPOSITION OF MANPOWER
1	Team Commander	1
2	Deputy Team Commander	1
3	Ops Planning Officer	1
4	Ops Planning Clerk	1
5	Ops Security & Safety Officer	1
6	Ops Security & Safety Clerk	1
7	Logistics Officer	1
8	Logistics Support Officer	5
9	Logistics Technician/Driver	2
10	Comms Officer	1
11	Comms Support Officer/ Technician	1
12	Liaison/Media Officer	1
13	Photographer	1
14	Medical Officer	1
15	Vet	1
16	Emergency Medical Technician (EMT)	3
17	Search & Rescue Platoon Commander	1
18	Deputy Search & Rescue Platoon Comd	1
19	Rescue Engineer	1
20	Rescuers	22

21	K9 Commander	1
22	K9 Handlers	4

The experience of the UAE USAR team in overseas and domestic emergencies since its creation in 2005 include the following missions and participations:

(i)   South Asian earthquake, Plackot City, Pakistan (October 2005).

(ii)   Indonesian earthquake, Central Java, Indonesia (May 2006).

(iii)   Indonesian earthquake, Sumatra, Indonesia (May 2007).

(iv)   Afghanistan earthquake, Afghanistan (August 2008).

(v)   Indonesian earthquake, Sumatra, Indonesia (October 2009).

(vi)   A massive road traffic accident involving 200 vehicles (March 2008). This major incident was the worst-ever multiple collision in the history of the country. It was caused by heavy fog and involved about 200 vehicles, including 12 buses rammed into each other on the Abu Dhabi–Dubai highway on the morning of 11 March 2008, resulting in four deaths and injuries to 317 people. Further, around 24 vehicles involved in the accident were destroyed by fire caused by the impact of the collisions. The accident caused a heavy traffic jam for several hours on the highway and the police had to divert the traffic to other routes. Emergency, ambulance and rescue vehicles of Abu Dhabi Police and fire engines of the Civil Defence Department as well as two helicopters from the Abu Dhabi Police Air Wing and that of Dubai Police all contributed to the calls and responded to the scene of the accident.

It must be stated that the author of this thesis is confident that the leading authorities in this country are aware of the importance of supporting emergency plans which will further enhance the preparedness and overall capabilities of the UAE to manage any crisis or disaster. This view (i.e. planning for the future and having safe individuals and society) has been reflected in the vision of the father of this nation, the late Sheikh Zayed Bin Sultan Bin Zayed Bin Khalifa Al Nahyan, who stated:

We need to look back at our steps, adjust our actions accordingly, plan for our future with hearts full of faith and a clear will, coupled with enlightened thinking, in order to perfect our march, and achieve for our people all that we hoped for.

CHAPTER 3

RESEARCH METHODOLOGY

3.0 Introduction

The present chapter describes the data collection procedures. That is, how data were collected, where the study was carried out, dependent and independent variables, how the sample was selected, the process of data analysis and ethical considerations addressed. A review of the instruments used is also given including the measures of reliability and validity for the main questionnaire utilised in this investigation.

3.1 Research design, main sample and participants

The present investigation has employed a mixed (qualitative and quantitative) descriptive research design, and involved a sample of 539 staff participants who were of different age, gender and level of education and experience. The goal for the study was to include a minimum of half of the emergency operating staff. However, the final outcome provided the researcher with 539 participants. All participants were working at the time in the Emergency and Public Safety Administration; and some were members of the International Search and Rescue team ADP GHQ. Some of the participants had considerable international emergency response experience as they are part of the recognised UN Search and Rescue team which had involvement in several international disaster search and rescue missions. Participants had to be licensed or provisionally licensed to practise under their professional title. Individuals who did not hold a licence or provisional licence to practise emergency services such as paramedics, doctors, nurses, ENT (ear, nose and throat) specialists were excluded. The majority of emergency response team staff who were involved in this study were very young. That is 62.5% of the sample were in the age group of 18–28 years, followed by 31.5% in the age group 29–39 years.

Focusing on gender participation within the sample included in this study, unfortunately and due to the nature of the demands of the fieldwork in the emergency profession, together with society and culture boundaries in the Arab world, the relative participation of the sample by female gender was very small represented by only 24 female participants. That is, only 4.3% of the participants in this sample were female compared to 95.7% males. The inclusion criteria for this study included emergency work experience and volunteer participation.

The results of this major study will be presented in two parts. Part one will focus on the outcomes of the content analysis of mainly material presented in Chapter 2, sections 2.4–2.6 and those of the operation procedure framework relevant to the staff working at the Emergency and Public Safety Administration at ADP GHQ. Hence the first part will evaluate the skills of emergency response and safety department team members. This is to answer the following research questions: How are various emergency response team members prepared for their task(s)? How are they trained? How are they monitored? Effort in this study was made to include a range of participants from a diverse group of staff working in the Emergency and Public Safety department at AD Police.

Table 3.1: Breakdown of the sample profile according to age, gender, education level, job title and experience

Age (in years)	18–28	29–39	40–50	More than 51	Total number
Frequency	337	170	25	7	539
Percentage	62.5%	31.5%	4.6%	1.4%	100%

Gender		Male	Female	Total
Frequency		515	24	539
Percentage		95.7%	4.3%	100%

Educational Level	Others	Primary	Sec Ed	High School	Diploma	University	Post Graduate	
Frequency	17	51	42	197	141	80	11	539
Percentage	3.2%	9.5%	7.8%	36.5%	26.2%	14.8%	2%	100%

Position	Field	Administrator	Head of Section	Group Leader	Total
Frequency	434	62	18	25	539
Percentage	80.5%	11.5%	3.4%	4.6%	100%

Years of Service	Less than one year	1–2	3–5	6–8	Over 9 years	Total
Frequency	153	103	125	122	36	539
Percentage	28.5%	19.3%	23.2%	22.6%	6.4%	100%

As noted, the aims of this study were twofold. Part one will focus on the outcomes of the content analysis of material presented in Chapter 2, sections 2.4–2.6 and those of the operation procedure framework relevant to the staff working at the Emergency and Public Safety Administration at ADP GHQ. Hence the first part will be devoted to evaluating the skills of emergency response and safety department team members, asking How are various emergency response team members prepared for their task(s)? How are they trained? How are they monitored?

Meanwhile, the second part of this study will highlight the psychological approach to the assessment of stress level, and include social and emotional stress level of staff and leaders working with emergency response teams. Overall and as indicated, this investigation is designed at first instance to evaluate the range of competencies of staff members working with various emergency response teams and then assess work-related stress among a sample of staff working at emergency agencies. Skills of emergency response and safety department team members – i.e. part one of this study – was assessed through the outcomes of the content analysis of material presented in Chapter 2, sections 2.4–2.6 and those deployed in the existing standardised international operation procedure framework. Meanwhile work-related occupational stress level and possible fatigue (i.e. the second main focus of this investigation) among the sample of staff working at the Emergency and Public Safety Administration, Abu Dhabi Police GHQ were assessed through the administration of the General Health Questionnaire (GHQ, Goldberg & Hiller, 1979). The General Health Questionnaire (GHQ-30) was expected also to detect any manifestation of PTSD or secondary traumatisation symptoms among staff working in the Emergency and Public Safety department at AD Police UAE.

3.2 Material

The General Health Questionnaire (GHQ-30) was used to examine the general health (psychological well-being, stress level and manifestation of secondary traumatisation or PTSD symptoms) of the main sample participants who volunteered to take part in this study. The aim

was therefore to assess manifestation of anxiety symptoms, somatic symptoms, social dysfunction and depression (Goldberg, 1972, 1978, 1983). The GHQ-30 (Goldberg & Williams, 1988) is a 30 item self-report questionnaire with an equal number of favourable and unfavourable options to choose from designed to detect the level of distress among respondents in both community and clinical settings. It was developed from the GHQ-60, the longer form. It is divided into four categories or sub-scales to assess anxiety symptoms, somatic symptoms, social dysfunction and severe depression. Each item is rated according to a Likert scale of 1, 2, 3 and 4. That is for each item or question the respondents have to indicate the occurrence of a particular symptom on a four-point scale: 'less than usual', 'no more than usual', 'more than usual', and 'much more than usual'. Good internal consistency has been reported in a number of studies with Cronbach's alpha coefficient ranging from .82 to .90 (Goldberg & Williams, 1988). According to Goldberg & Hillier (1979), the most efficient caseness threshold for community sample is 4/5.

This questionnaire is widely used to detect psychiatric disorder in the general population and within community or non-psychiatric clinical settings such as primary care or general practice. It is also used by researchers studying different areas such as occupational and health related stress. The GHQ-30 produces an overall score that can be compared with a prescribed cut off score. The GHQ-30 is the most widely used valid and reliable instrument with important features including the ability to detect stress level with a given threshold (Hosin, 1986).

The GHQ comes in four versions; a 60 item version (GHQ-60), a 30 item version (GHQ-30), a 28 item version (GHQ-28) and a 12 item version (GHQ-12). The four versions of the GHQ are connected to each other because they contain similar items even though diverse scoring techniques can be used for the questionnaire including a modified Likert-type scoring technique. The total score is produced and compared with threshold level. The total score shows the intensity of psychological well-being where a higher score shows higher levels of morbidity and/or weaker general health level.

It worth noting that GHQ-12/30/60 all yield an overall total score. The GHQ-28 is a scaled version, yielding four sub-scores, each based on seven items and a total score. The appendix shows the GHQ-30 questionnaire used in this study.

As noted, the internal consistency of the questionnaire items was calculated. The figures displayed below demonstrate alpha coefficients for the main items, separately and collectively. The Cronbach's alpha coefficient at the level of each and every survey

item was found to be 0.93, while the coefficients of reliability for all items ranged between 0.79 and 0.81. Hence this questionnaire demonstrated a high level of internal consistency and high reliability.

Also included in the appendix is a letter from London Metropolitan University sent to the selected emergency staff participating in the study. The letter included the aims and details of the study, the criteria that needed to be fulfilled, information on confidentiality and the right to withdraw, together with a personal consent form for the individual participants.

3.3 Procedures

The GHQ data were collected through meetings and sending the questionnaire to all those emergency staff working at AD Police who were informed about the aims, the rationale and objectives of this study, and who ultimately volunteered to take part in this study. Focusing on data collection two qualified research assistants were taught how to administer the GHQ and obtained consent from the participants. The two trained research assistants have themselves completed the all data collection stage including the administration of the GHQ. A translated Arabic version of GHQ (Hosin, 1986) was used to assess the level of psychological well-being including PTSD and secondary traumatisation symptoms among participants. Thus, within 40 minutes most the participants were able to complete the questionnaire and the process was supervised and administered by trained and qualified research assistants. After completing the questionnaire the participants were debriefed and any further questions from them were answered.

Out of 1,780 staff working in the Emergency and Public Safety department at AD Police, 539 staff who met the entry criteria volunteered and gave consent to take part in the study. Content analysis were used – for the data collected from national framework and standard operation procedures- along the quantitative data. The latter used the GHQ-30 and utilised the Statistical Package for Social Sciences (SPSS) which performed an independent t-test to compare the level of stress reactions, PTSD and secondary traumatisation for a range of variables.

As noted, the data collection was carried out by two independent trained and qualified research assistants. One of the research assistants was a university student with prior experience of conducting psychological research, and the other was a member of staff working at Centre for Police Studies with considerable research experience and work of a similar nature. Both were given instructions on their role and permitted a level of input in the process of data collection. The

participants were informed about the aims of this study and told that the study was mainly concerned with the psychological well-being of staff working in emergency services. This was done in order to control for the participant responding in a socially desirable manner so as to avoid the stigma attached to mental diagnoses such as PTSD and clinical anxiety. The participants were also informed that names were not needed on the forms. Confidentiality and the right to withdraw from the study at any time were emphasised in the information sheet and verbally by the data collectors for honest responding. Furthermore, it was highlighted to the participants that there were no right or wrong answers, and that they should refrain from conferring with each other. The instructions on how to complete each questionnaire were exhibited on the questionnaire itself, and the participants were encouraged to ask the data collector/s if they failed to understand any items. Following the completion of the questionnaire, the participants were all debriefed with a full explanation of the aim and rationale of the study and any questions were addressed.

3.4 Ethical considerations

All participants were informed at the briefing, consent and debriefing stages that the participants' individual results would not be identified to a third party unless the researcher and the researcher's supervisor believed the participant to be significantly distressed and perhaps in need of further assessment for their safety and well-being.

Ethical consideration such as confidentiality, right to withdraw, volunteer participation, avoiding deception or conflict of interest and informed consent were also addressed. This includes explaining the purpose of the research, the role of participants and possible alternatives to participation and other ethical and legal rights.

Furthermore, before the administration of the scales, the researcher provided a written consent form and attached it to the questionnaire (see appendix) for participants to read and consider before answering any question. All participants were asked to provide a form of identity on the form and asked to write their age, sex, level of education, and number of children before responding to the substantive items. Following the ethical guidelines and debriefing on confidentiality and the right to withdraw from the study, the participants were given additional details on the nature of this study and its major aims and were asked to contact the author of this project should they have further questions about this research work.

Additionally, the participants received information which clearly stated the name of the researcher and contact, what the study involved, confidentiality, time for completing the questionnaires and the right to withdraw from the study. Also before filling in the questionnaires, measures were taken to put them at ease, relaxed and comfortable through conversation and building rapport. Participants were reminded of confidentiality throughout, and under what conditions it might be broken. The participants were also told that there were no wrong or right answers and all answers would be treated with respect. Finally, they were asked whether they had understood what had been said and whether they had any questions. After the briefing, the participants were given consent forms to sign if they agreed to take part in the study. They were also told that they were free to withdraw from the study at any time without giving reason if they wished to do so.

Participants were further reminded that the information sought was for research purposes only; no names of participants were required, and responses would be kept confidential. Participants were encouraged to complete the questionnaires accurately. They were also told that confidentiality would be breached if the researcher observed that the participants or anyone else was at risk of any harm. The participants were further told that the questionnaires would only be read by the researcher and the supervisor, after which all questionnaires would be kept for a certain duration, locked away, and later destroyed.

After filling in the questionnaires, the researcher explained to the participants that there were no wrong or right answers and also informed them that all people are not the same and that the experiences that they went through might not have been the same as those of others. The researcher further explained to all participants how the data collected would be stored and assured them that nobody else apart from those individuals mentioned earlier would have access to the information; and if they wished to withdraw from the study they were free to do so at any stage.

With the information sheet the researcher provided a form which clearly stated the name of the researcher and his contact and supervisor's contact along with other information such as confidentiality, time for completing the questionnaires and the right to withdraw from the study. All participants were asked whether they had understood what had been said and whether they had any questions.

Overall, the ethical considerations taken into account in the current study include ethical approval to be granted from both the participants included in the sample and their workplace and/or main organisation that the researcher had to approach. In brief, ethical considerations included individual consent, right to withdraw, data protection access, no harm, no deception and debriefing and other considerations highlighted in the research ethical guidelines of BPS, APA and London Metropolitan University. All of the above had to be observed before data were collected.

CHAPTER 4

RESULTS

4.0 Introduction

The main results of this study are presented into two main parts. Part one focuses on the outcomes of the content analysis and grouping of material presented in Chapter 2, and the recognised needs and subsequent implementation of several initiatives that are closely associated to UNISRD. These initiatives are presented and discussed in chapter two sections 2.4-2.6 and the focus here will be on the relevant Continuing Professional Development (CPD) training programmes that have been provided during the last three years 2011–2013 to staff working at the Emergency and Public Safety Administration ADP GHQ. The hope is that these CPD programmes will help to answer the research questions proposed earlier: How are various emergency response team members prepared for their task(s)? How are they trained? What is the nature of their training? How are they monitored?

Meanwhile, part two of the results chapter will focus on the psychological well-being and assessment of stress level including social and emotional stress level of staff and leaders working with emergency response teams. Overall, this investigation is designed at first instance to evaluate the nature of training programmes, the competence of staff members working with various emergency response teams and assessing work-related stress among a sample of staff working at emergency agencies.

Other questions that were addressed in this investigation include:

(i) Do safety guidelines exist in several organisations that are designated to provide relief and emergency care in crisis and/or disasters?

(ii) Are there defined roles for the key players in the crisis management team?

(iii) Are the communication protocols and the crisis organisation structure defined?

(iv) Have crisis management briefing and training sessions often take place?

(v) Is there general awareness of specific role training courses often available and in place?

(vi) Are there corporate crisis exercises to test and practise the plans which run frequently from desk to exercises and involve external stakeholder participation?

(vii) How do senior management and existing policies deal with general occupational stress and the workloads of staff working in such demanding environments?

As noted, this study is also an attempt to investigate the main factors that contribute to the vulnerability of members of emergency teams and the possible manifestation of professional stress and/or fatigue and hence inadequate performance while managing emergency, crisis and/or disasters. Overall, results of content analysis of skills development and training programmes indicated the nature and numbers of the courses that are delivered to staff of the Emergency and Public Safety (EPS) Administration, see tables 4.1, 4.2 and 4.3 below and appendix.

Table 4.1: The number of training programmes delivered for staff of the Emergency and Public Safety Administration, AD Police GHQ during 2011, 2012 and the current year 2013*

Year	Total number of training programmes	No of staff participants attended the delivered training programmes
2011	60	969
2012	81	1122
2013	60	70
Total	301	2161

*Year 2013 training included January–June 2013

Tables 4.1, 4.2 and 4.3 and the appendix attached clearly indicate the numbers of CPD programmes delivered to the EPS staff, the nature of the course or coverage, venue and partner(s) agency contributing to the delivery of the CPD courses. Table 4.1, for example, shows the total number of courses delivered during the past three years (2011–2013) and the number of EPS staff who participated in these staff development programmes. It is revealed that there were 301 programmes and 2161 ESP staff attended these courses.

Table 4.2: Example of refresher courses provided to established staff of the Emergency and Public Safety Administration, AD Police GHQ that aimed to enhance skills and performance of the staff. Date, venue and partner international agency involved in this programme training are highlighted

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introduction of refresher Course

s	Date	Course	Agency	Venue
1	20-31/1/2013	Refresher Course	UAE SAR Team + Singaporean Civil Defense	Abu Dhabi
2	6-17/10/2013	Refresher Course	UAE SAR Team + Singaporean Civil Defense	Abu Dhabi
3	24/11-5/12/2013	Refresher Course	UAE SAR Team + Singaporean Civil Defense	Abu Dhabi
4	15-19/12/2013	Evaluation and classification as Heavy USAR Team	UAE SAR Team + Singaporean Civil Defense	Abu Dhabi

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Abu Dhabi Police GHQ.

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Table 4.3: Various training programmes delivered to UAR Search and Rescue (UAE SAR) of the Emergency and Public Safety Administration, AD Police GHQ conducted with Singaporean SAR partner in 2012

Table 4 presents the various training programmes delivered to UAE Search and Rescue UAE SAR of Public Safety and Emergency Administration team conducted with Singaporean SAR partner in 2012

S	Training course	Number of Participants		
		CO	NCO	Total
1	SAR - Group 1 25.6.2012 – 27.7.2012	2	30	32
2	Logistical support training 16.7.2012 – 27.7.2012	2	7	9
3	Medical Support training 16.7.2012 – 27.7.2012	7	-	7
4	Joint Advanced Training (Al Shleilah) 7.10.2012 - 24.10.2012	2	20	22
5	SAR Group 2 8.10.2012 - 9.1.2012	1	20	21
6	Technical Support & Communications 28.10.2012 - 31.1.2012	2	9	11
7	UAE SAR Group Leaders Course 20.1.2012 - 9.1.2012	21	-	21
8	SAR Group 3 4.2.2012 - 8.3.2012	2	24	26
	Total	18	110	149 (all novice)

It was revealed that a wide range of important CPD programmes were introduced to EMP staff. The coverage of these programmes which were conducted nationally or locally include emergency medical support, emergency technical support, communication, leadership and refresher courses delivered to established EPS staff (see Tables 4.2, 4.3 and 4.4). Other important CPD training programmes provided to EPS staff during 2011–2013 include first respondent courses, basic training on evacuation, comprehensive rescue exercises in close and confined space, fire skills development in fire-fighting, fighting rehabilitation course, collapsed building emergency, diving inspections, emergency for shipping accidents, flood rescue, fire and listing of damage, fire prevention techniques, descending from high spaces, evacuation of victims from high rise buildings, industrial and health hazard training, emergency and shipping fire security procedures, disaster victim identification, searching in debris of collapsed buildings, the art of cutting through vehicles and saving trapped passengers, ship fire control, evacuation of victims during fire on board a ship, diving courses, fundamental ship fire control, respiratory device maintenance, and radiation emergencies: prevention and control. The duration of these courses was between a few days, one week and three months. For further details on the topics delivered, places of delivery, date, partner delivered with, see the appendix attached.

Table 4.4: Title of the professional development course, duration and number of participants

Course	Beneficiary	Participants	Duration	Execution		Training Agency
				from	To	
Comprehensive Rescue 15 (Fire)	EPS	43	3 months	19/12/2010	20/3/2011	Training Section
Rescue from closed and confined spaces	EPS	9	One weak	9/1/2011م	12/1/2011م	Training Section
Rescue from closed and confined spaces	EPS	8	One weak	9/1/2011م	13/1/2011م	Training Section
Rescue from closed and confined spaces	EPS	8	5 days	30/1/2011	3/1/2011	Training Section
Basic SAR training course (643)	EPS	9	2 weaks	6/2/2011م	17/2/2011م	Training Section
Refresher training in the use of hydraulic, electric and manual tools, air bags and fire extinguishers	EPS	74	12	13/2/2011	24/2/2011	Training Section Training Unit/ Al Ain
Fire and rescue trainers training course	EPS	12	5 days	14/3/2011	24/3/2011	Training Section
Hazmat basic course (Group 1)	EPS	22	19	27/3/2011	14/4/2011	Training Section
Rescue from closed and confined (1091)spaces	EPS	17	5 days	24/4/2011	28/4/2011	Training Section
Rescue from closed and confined spaces	EPS	9	5 days	24/4/2011	28/4/2011	Training Section
Lift/elevator control course	EPS	19	18	9/5/2011	26/5/2011	Training Section
Rescue rehabilitation (Group 1) course	EPS	62	5 days	15/5/2011	19/5/2011	Training Section
Action in the event of fire outbreak	EPS	15	2	15/5/2011	19/5/2011	Training Section
Respiratory devices (1227) maintenance Basic course	EPS	14	5	15/5/2011	19/5/2011	Training Section
Fire fighter rehabilitation course (Group 1)	EPS	22	12	5/6/2011	16/6/2011	Training Section Al Aweer Center/Dubai
Fire fighter rehabilitation course (Group 2)	EPS	18	12	19/6/2011	30/6/2011	Training Section Al Aweer Center/Dubai
Fire fighter rehabilitation course (Group 3)	EPS	13	12	3/7/2011	14/7/2011	Training Section
Fire fighter rehabilitation course	EPS	13	30	3/7/2001	2/8/2011	Training Section
...training Instructor course (Group 1)	EPS	4	12	25/9/2011	6/10/2011	Training Section Al Aweer Center/Dubai

Focusing further on staff development, resources and capability, it should also be indicated that programmes focused on raising skills and knowledge of ESP staff in area such GIS and for areas supporting Gold, Silver and Bronze commanders were also increased. Other major capability and staff development included

- raising the maturity of staff through close interaction of new and fresh graduates staff using mentors and experienced specialised officers from the law enforcement domain;
- building analytical/critical thinking of the staff (gradually) via various courses.

It was also noticed from the annual training programme or calendar which has been produced by the Training Administration of AD Police GHQ that some of the CPD programmes delivered to EPS staff included training on working under unusual circumstances, appreciation of cultural differences, working in a team and meeting customers' needs and public confidence and/or society expectations of the level of services that are provided.

4.1 Main results of General Health Questionnaire (GHQ) research survey

This section of the results chapter will discuss the level of work-related stress among a sample of staff working at the Emergency and Public Safety department EPS, Abu Dhabi Police, GHQ, UAE. The total number of the participants employed in the sample study as indicated above were 539 staff participants who were of different age, gender and level of experience. Table 4.5 shows the relative age distribution of the main sample of this study.

Age

Table 4.5: Relative distribution of sample by age group

Age (in years)	18–28	29–39	40–50	More than 51	Total number
Frequency	337	170	25	7	539
Percentage	62.5%	31.5%\	4.6%	1.3%	100%

Table 4.5 shows that more than half of the surveyed sample (62.5%) are in the age group of 18–28 years, followed by 31.5% in the age group 29–39 years. The results also indicated that participants of older age represented a rather small percentage. Hence, the age group 40–50 amounts to 4.6% while the category of 51 years plus

represented 1.3% of the total number of the surveyed sample. It is therefore safe to conclude that the majority of staff working at the department of Emergency and Public Safety are young and perhaps energetic. Focusing on gender participation within the sample of this study, Table 4.6 displays the relative distribution of sample by gender

Gender

Table 4.6: Relative distribution of sample by gender

Gender	Male	Female	Total
Frequency	515	24	539
Percentage	95.5%	4.3%	100%

Table 4.6 clearly shows that the number of female participant staff at the department of Emergency and Public Safety is very small. Only 4.3% participants in this sample were female. The majority of staff are male (95.7% of the sample participants were male). Given the nature of this conservative culture and society, and perhaps the nature of the demands of police emergency work, this low percentage of participation by females is perhaps expected, and could be the norm in most of the Gulf region and the Arab world. Indeed, the number of females in police work is still low compared to males, particularly in the Emergency and Public Safety department. As noted, this is perhaps due to the nature of the fieldwork involved, and the demands placed on paramedic aid work in the ambulance services and other work involved such as search and rescue, emergency and disaster, etc.

Education

Table 4.7: The level of education among the participants included in the main sample of this study

Educational Level	Others	Primary	Sec Ed	High School	Diploma	University	Post Graduate	
Frequency	17	51	42	197	141	80	11	539
Percentage	3.2%	9.5%	7.8%	36.5%	26.2%	14.8%	2%	100%

Results of this study revealed that approximately one third of the sample participants had a high school education certificate (36.5%), i.e. had completed grade 12 education. This was followed by post high school Higher Education or HE diploma (HEDip) holders (26.2%), then bachelor's degree holders (14.8%) and postgraduates (2%). It does seem

that education is emphasised in the recruitment of workers for emergency and public safety, search and rescue as well as the domain of emergency and disasters. The percentage decreases when the level of education becomes less than secondary, i.e. 'secondary, primary and others'. As noted in these cells in Table 4.7 the percentages were 7.8%, 9.5% and 3.2% respectively. It should be also noted (see Table 4.7) that the recruitment in this sector has attracted Master's and PhD level, high quality specialised trained staff to the EPS department. Eleven participants (i.e. 2% of the main sample recruited in this study) were EPS staff holding Master's or PhD degrees. Overall, over 42% of the present sample had been exposed and/or been educated at university level. As public safety is one of the priorities of AD Police's 2012–2016 strategic plan, more emphasis has now been placed on quality, education, development and recruitment of staff working in this sector. Indeed, the first priority of the above noted strategic plan clearly stated that 'Abu Dhabi Police should mobilise resources to develop and train staff effectively to respond to all potential crises and disasters and major incidents threatening the infrastructure, the strategic or diplomatic agencies and community safety.' Indeed the aim is to develop and modernise the Abu Dhabi police force in line with international police best practice through the recruitment and development of best qualified staff, hence wining public confidence that they are living in a safe and secure society. Overall, the establishment and expansion of the new Emergency and Disaster department as well as the Emergency Medicine Academy and other ongoing organisational developments should fulfil the vision of the six priorities of the 2012–2016 Abu Dhabi strategic plan on high quality staff and workforce development.

Marital status

Table 4.8: Profile distribution of the sample according to marital status

Marital Status	Bachelor	Married	Widower	Divorced	Total
Frequency	263	261	7	8	539
Percentage	48.8%	48.6%	1.2%	1.4%	100%

Still focusing on the main sample profile, Table 4.8 displays the profile distribution of the participants working at the Emergency and Public Safety department according to their marital status. Distribution of married and bachelor adults is almost identical or nearly equally divided: bachelor participants in the sample were 48.8%, and the married participants were 48.6%,

respectively. The divorced participants were only small proportion (1.4%); while the widowers formed the lowest percentage (1.2%) of the total number of the sample.

Household members

Table 4.9: Relative distribution of sample's number of household members

Number of Household Members	Less than 3	4–7	8–11	12–15	More than 16	Total
Frequency	129	93	38	9	7	276
Percentage	46.8%	33.6%	13.7%	3.4%	2.5%	100%

Table 4.9 shows that approximately half of the sample who are married, widowers and divorced members had fewer than 3 persons in their household. This constituted (46.8%) percent of the sample. Families comprising 4–7 persons account for 33.6%, the category of families with 8–11 members represents 13.7% of the married population of this sample. The percentage drops further as the number of family members exceeds 12 persons. This applied to those families with 12–15 members (3.4%), and for families having more than 16 members, the percentage was 2.5% of the married population sample.

Position and role

Table 4.10: Position of participants and the nature of their work at the EPS department

Position	Field	Administrator	Head of Section	Group Leader	Total
Frequency	434	62	18	25	539
Percentage	80.5%	11.5%	3.4%	4.6%	100%

Table 4.10 shows the distribution of sample members according to their work and positions at the Emergency and Public Safety department. Results on the nature of the work variable revealed that 80.5% of the participants are exposed to and/or involved with daily fieldwork experience. The high percentage of fieldworkers can be attributed to the nature of demands and daily work of the Emergency and Public Safety department, which includes ambulance emergency work, involvement in rapid intervention and civil defence as well search and rescue activities and other emergency matters including

participation in manmade and natural disasters. Administrative employees represented 11.5% of the sample. Head of sections and group leaders personnel positions were almost equally divided with group leaders representing 4.6% while heads of section were only 3.4% of the sample studied.

Years of service and work experience

Table 4.11: Sample distribution according to length of service

Years of Service	Less than one	1–2	3–5	6–8	Over 9	Total
Frequency	153	103	125	122	36	539
Percentage	28.5%	19.3%	23.2%	22.6%	6.4%	100%

The data of Table 4.11 indicate that half of the workforce sample of the EPS administration (52.2%) have more than three years' experience. Only 28.5% of the sample participating in this study had spent less than one year in the EPS. Results further indicated that 19.3% of the sample have had 1–2 years' experience, followed by participants with 3–5 years of service (23.2%). Participants with 6–8 years' service represented 22.6% of the sample. Meanwhile sample participants with 9 years and over of work experience at the EPS represented 6.4% of the population studied. Overall, almost one third of the sample (29%) had professional work experience of between 6 and 9 years at ESP.

Outcomes of professional training courses, preparedness and participation

Table 4.12: Distribution of CPD training provided to sample participants

Number of training courses	Less than 2	3–6	10–7	11–15	Over 16	Total
Frequency	86	80	21	4	3	194
Percentage	44.4%	41.3%	10.8%	2%	1.5%	100%

Reflecting on the results provided in the introduction to this chapter, and despite the EPS Administration's efforts regarding staff development which deploy the 2012–2016 ADP strategic vision on workforce development, unfortunately the results of this study revealed that only 194 participants (36%) of this particular chosen sample were exposed to staff and/or continuing professional development training. Meanwhile 345 participants constituting 64% of the sample members have indicated that they had had

no staff training courses. This is a negative index and should be immediately addressed as lack of training can have a detrimental impact on overall performance and hence could generate relevant work-related stress and perhaps negative emotions. Of the total 194 participants who have been exposed to professional continuing staff development programmes, 44.4% (n = 86) of the sample had participated in less than two planned courses; 41.3% (n = 80) were exposed to three to six staff development courses. Meanwhile 10.8% (n = 21) were exposed to seven to ten staff development continuing education programmes. Furthermore, four participants of the sample have had over 11 training courses, with only three members of the sample (1.5%) who had been on 16 staff development courses. It seems that staff development training programmes and opportunities exist but the level of their frequency and exposure should be extended perhaps beyond the 90% mark of workforce.

Outcomes of preparedness

Table 4.13: Participants' satisfaction with EPS preparedness

Satisfaction with preparedness	Weak	Good	Excellent	Undetermined	Total
Frequency	86	336	80	37	539
Percentage	16%	62.3%	14.8%	6.9%	100%

Table 4.13 clearly indicates that more than half of the sample of staff at the EPS department are satisfied with the efficiency of the equipment and tools used to carry out their duties. Those who view the preparations as good accounted for 62.3% of the sample included in this study. Further 14.8% (n = 80) declared that the preparedness of the service was excellent. Only a few (16%) of the sample regarded their preparedness as weak. Of the rest, 37 (6.9%) participants did not declare their position, and were undetermined.

Outcomes of previous participation in rapid development emergency response

Table 4.14: Previous participation of the sample in rapid development emergency response

Previous Participation	1–2	3–5	6–8	More than 9 times	Total
Frequency	51	37	14	5	107
Percentage	47.6%	34.5%	13.3%	4.6%	100%

Table 4.14 shows that the number of EPS members of this sample who have participated in previous emergency rapid deployment missions was 107 (19.8%). This relatively low figure may be due to the fact that since the creation of the Search and Rescue team, most outside missions have been conducted by that professionally dedicated team.

Overall, almost half of this participating sample who previously engaged in rapid deployment missions have contributed 1–2 times to such missions; followed by candidates who contributed 3–5 times (34.5%). Fourteen staff (13.3%) had participated 6–8 times and 5 staff (4.6%) of the participating individuals have contributed more than 9 times.

Results of local versus international participation

Table 4.15: Local and international participation of the sample

Geographical area of participation	Local	International	Total
Frequency	79	28	107
Percentage	73.8%	26.2%	100%

Table 4.15 reveals that a high percentage (73.8%) of previous participation of the sample members was local. Participation in international missions was found to be 26.2% of the total number of the survey sample.

Sample responses to various items of the General Health Questionnaire

Table 4.16: Mean and standard deviation of the sample responses to various items of the General Health Questionnaire (GHQ) used in this study

SN	Items	Less than usual	Same as usual	Better than usual	Arithmetic mean	Standard deviation
1	Have you recently found yourself able to focus your attention on the work you have been doing?	8.5%	31.2%	60.3%	2.517	0.6489
2	Have you recently lost a lot of sleep due to anxiety?	16.5%	38.8%	44.7%	2.282	0.73055
3	Have you recently felt that you are carrying out your responsibilities and undertaking useful roles?	11.1%	37.5%	51.4%	2.402	0.6811

4	Have you recently felt being able to take decisions on various matters?	12.4%	36.4%	51.2%	2.387	0.6977
5	Have you recently felt being always tense and strained?	22.4%	41.7%	35.8%	2.133	0.7521
6	Have you recently felt that you are unable to overcome your difficulties?	23.6%	37.8%	38.6%	2.15	0.774
7	Have you recently found yourself being able to enjoy normal daily activities?	18.4%	37.7%	44%	2.256	0.7475
8	Have you recently found yourself being able to confront your problems with confidence?	14.3%	36.7%	49%	2.346	0.7164
9	Have you recently felt that you are unhappy and depressed?	29.9%	34.5%	35.6%	2.057	0.8079
10	Have you recently started to lose confidence in yourself?	27.5%	36.4%	36.2%	2.087	0.7936
11	Have you recently considered yourself as a valueless person?	33.6%	32.3%	34.1%	2.005	0.8236
12	Have you recently felt a reasonable amount of happiness?	18.9%	41%	40.1%	20211	0.7391
13	Have you recently been able to occupy most of your time doing same thing?	18.7%	40.3%	41%	2.222	0.7408
14	Have you recently felt that your leaving the house and interaction with others have become natural or normal?	17.1%	40.8%	42.1%	2.250	0.7280
15	Have you recently felt that you have been able to manage your affairs in a satisfactory manner?	21.5%	35.8%	42.7%	2.211	0.7735
16	Have you recently felt that you have been satisfied with the performance of your duties?	13.5%	35.8%	50.6%	2.371	0.7107
17	Have things been getting difficult recently?	29.7%	38%	32.3%	2.026	0.7874
18	Have you recently felt that all things are accumulating over you?	23.7%	41%	35.3%	2.115	0.7601
19	Have you recently felt that you have been nervous and tense all the time?	28.6%	36.4%	35.1%	2.064	0.7958
20	Have you recently found yourself unable to do anything because of tension?	28.2%	36.7%	35.1%	2.068	0.7931
21	Have you recently suffered from insomnia and uncomfortable troubled nights?	25.2%	33.2%	41.6%	2.163	0.8015

22	Have you recently found yourself being able to manage your affairs just like most people undergoing the same circumstances do?	12.1%	41%	46.9%	2.348	0.6849
23	Have you recently found yourself being able to feel affection for those around you?	12.4%	38.6%	49%	2.365	0.6938
24	Have you recently become easy in dealings with others?	13.4%	38.4%	48.2%	2.348	0.7037
25	Have you recently spent long time in conversation with others?	17.1%	39.5%	43.4%	2.263	0.7324
26	Have you recently felt that life is a constant conflict at all times?	20.8%	39.1%	40.1%	2.192	0.7565
27	Have you recently been gripped by unjustified fear and panic?	32.1%	33.6%	34.3%	2.022	0.8154
28	Have you recently felt that life brings despair?	32.3%	35.3%	32.5%	2.001	0.8054
29	Have you recently become optimistic about your future?	16%	31.9%	52.1%	2.361	0.7423
30	Have you recently felt that life is not worth living?	33.4%	32.7%	34%	2.005	0.8214

Responses to GHQ by gender

Table 4.17: Responses to various items of the General Health Questionnaire (GHQ) by gender

Variables	Percentage	Mean	SD
Male	95.7%	2.2176	0.43688
Female	4.3 %	2.0130	0.33162

The outcomes presented in Table 4.17 show that the males in the study sample scored higher levels of health-related stress compared to their female colleagues: the mean score of male participants was 2.2176 compared to females' score of 2.0130. When the mean was calculated using the main job as variable (see Table 4.10), it was found that heads of section and main fieldworker participants scored higher on the GHQ (M = 2.3833; 2.3155 respectively); followed by admin and fieldwork staff (M = 2.1784 and 2.1387 respectively).

Sample responses to GHQ according to main job

Table 4.18: Mean (M) and Standard Deviation (SD) of participants responding to GHQ using their job as main variable

Variables	Percentage	Mean	SD
Fieldworker	80.5%	2.3155	0.49593
Administrator	11.5 %	2.1784	0.42237
Head of section	3.4%	2.3833	0.39577
Group leader	4.6%	2.1387	0.30226

It seems that mental health and well-being and/or job-related stress is less among administrators and group leaders staff (M = 2.1784, M = 2.1387, respectively). Section heads seem to score higher on the GHQ than other colleagues, with mean score reached (M = 2.3833). This may be attributed to the nature of their daily responsibility, i.e. performance and achievement goals, tasks, supervision assignments on a daily basis.

Sample responses to GHQ according to age

Table 4.19: Mean scores of the GHQ according to age groups of participants

Variables	Percentage	Mean	SD
18–28	62.5%	2.2633	0.46075
29–39	31.5%	2.1367	0.37444
40–50	4.6%	2.0226	0.35352
51 and above	1.3%	9476	0.24403

When the sample was further divided according to their age groups, it was revealed that the older age group in the sample (40–50 years old) had lower mean score when compared with their younger counterparts (29–39 years old and 18–28 years old). It does seem that younger and relatively inexperienced staff were more vulnerable than older staff.

Sample responses to GHQ according to education

Table 4.20: Mean scores of GHQ according to relevant education of main participants

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Variables	Percentage	Mean	SD
Non-declared	3.2%	2.0915	0.33458
Primary	9.5%	2.1032	0.31767
Secondary	7.8%	2.1121	0.41155
High school	36.5%	2.2118	0.28335
Diploma	26.2%	2.3412	0.42696
University degree	14.8%	2.4174	0.55174
Post graduate	2%	2.4879	0.37157

Table 4.20 clearly shows that mean GHQ scores increase with the relevant education level of participants who responded to the GHQ. The relevant work-related stress reflected through the GHQ scores among post-graduate degree holders was 2.4879, among university degree holders 2.4174 and among diploma holders 2.3412. This tendency of higher scores may reflect the specialised nature of the work assigned to qualified staff.

Sample responses to GHQ according to marital status

Table 4.21: Mean scores of GHQ according to marital status of main participants

Variables	Percentage	Mean	SD
Bachelor	48.8%	2.2770	0.46816
Married	48.8%	2.1323	0.3431
Widower	1.2%	2.1571	0.40310
Divorced	1.4%	2.2083	0.38822

Table 4.21 shows the percentage scores of both bachelor and married participants to be identical, though the bachelor participants show slightly higher mean score (M = 2.2770) than the married subsample.

Sample responses to GHQ according to length of service

Table 4.22: Mean scores of GHQ responses according to the length of service at the EPS

Variables	Percentage	Mean	SD
Less than one year	28.5%	2.5359	0.42159
1–2	19.3%	2.0835	0.37340
3–5	23.2%	2.0816	0.42330
6–8	22.6%	2.0486	0.30240
Over 9 years	6.4%	2.1570	0.31672

As expected, Table 4.22 shows that new and inexperienced EPS staff members (with less than 1 year of service) are likely to score higher on the GHQ (mean score = 2.5359). Furthermore and apart from the small number of sample participants with nine years' experience, it seems fair to suggest that relevant experience is an important protective factor for work-related stress as reflected by the GHQ scores, (see Table 4.22 GHQ mean scores). Work-related vulnerability to stress may be due to lack of experience and important skills that are required in the field of rapid intervention and response such as ambulance service or fire-fighting which involve a high degree of risk during action. The level of work stress is almost the same among the 1–2 years, 3–5 years and 6–8 years groups, with an average mean scores of 2.0835, 2.0816 and 2.0486 respectively.

Sample responses to GHQ according to length of service

Table 4.23: Comparison of GHQ mean scores between those participants who attended prior specialised emergency training and those who never participated in similar programmes

Variables	Percentage	Mean	SD
Participation in specialised courses	36%	2.1120	0.40209
No participation in specialised courses	64%	2.2621	0.44333

Similarly, Table 4.23 shows that experience gained through training can contribute to skills development and performance and buffer individuals from vulnerability and work-related stress as reflected by the GHQ scores. More specifically, Table 4.23 indicates that individual EPS staff in this study, particularly those who participated in prior specialised emergency training programmes

score lower on GHQ than their counter group participants who had no prior emergency staff development training. Apart from vulnerability to work-related stress, lack of staff development training is more likely to influence negatively performance and perhaps contribute to poor job satisfaction.

GHQ scores and work-related stress

Table 4.24: Relevant work-related stress among the EPS sample as reflected by GHQ scores and some demographic variables

Sn	Variables	degree of freedom (df)	Chi-square (X^2)	Significance level	Compatibility coefficient
1	Age	3	523.286	0.001	0.51
2	Sex	1	449.933	0.001	0.29
3	Educational Level	6	368.338	0.001	0.70
4	Marital Status	3	484.013	0.001	0.53

Results displayed in Table 4.24 reveal significant differences at 0.001 level among respondents of different age groups and their stress level as reflected by the GHQ scores. X^2 value = 523.282, with degree of freedom (df) = (3) and the compatibility coefficient = (0.51). Similarly Chi^2 value = 449.933 reveals significant difference at 0.001 between males and female mean scores of GHQ. Level of education and vulnerability to stress among participants as reflected by the GHQ mean score was significantly important too. Also widowers and divorcees were more vulnerable to stress than their counterparts, the single and married staff members.

Comparison of position, length of service and prior training

Table 4.25: Comparison of significance levels reached among participant staff according to their position, length of service and prior training

Sn	Variables	Df	Chi²	Significance level	Compatibility coefficient
1	Position	3	719.323	0.001	0.52
2	Length of service	4	79.184	0.001	0.63
3	Training	15	279.237	0.001	0.89

Table 4.25 reveals significant differences between EPS staff holding various positions. Chi² value = 719.323, with degree of freedom (3) and the compatibility coefficient = (0.52). Length of service, seen also to be an important variable in work-related stress, is reflected by GHQ score. Chi² value for this variable reached 79.184, with degree of freedom (4) and significance level of 0.001. Similarly prior professional training is demonstrated to be an important buffer for work-related stress as reflected by the GHQ scores. Chi² value for this variable was 279.237, with degree of freedom (15), compatibility coefficient was 0.89 and 0.001 significance level.

Other influences on work-related stress

Table 4.26: Other variables that influence work-related stress

Order	Health issue variable	Arithmetic mean
First	Effective performance of duties	2,3584
Second	Feeling of happiness and enjoyment of life	2,2127
Third	Self-confidence	2,1492
Fourth	Feeling of fear, anxiety and despair	2,1471

Table 4.26 shows the order of variables that influence work-related stress and individual well-being as reflected by Goldberg's GHQ-30 questionnaire. These variables have been listed in descending order and reflect the amount of work-related stress

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experienced by the respondents working at the Emergency and Public Safety department of Abu Dhabi Police GHQ. Overall, effective performance of duties was the highest among factors affecting work-related stress with mean score of 2.3584, followed by feeling of happiness and enjoyment of life ranked second highest in the respondents' choices of health issue variables and their impact on work stress with mean score of 2.2127. Other important variables included individuals' self-confidence which ranked third with mean score of 2.1492. Participants felt that psychological feelings and self-confidence have specific impact on individual performance. These include the feeling of fear, anxiety and despair ranked fourth, with a mean score of 2.1471. Overall, it seems that human vulnerability, fatigue and distress are determined by both physical or biological features and acquired skills and capabilities.

4.2 Summary of participant profile, main results and implcations

The results relating to sample profile suggest that the vast majority of the participants included in the sample were males, while the females account for only 4.3% of the participants. This investigation has also shown that young individuals constitute the majority of the participants (62.5%) who are in the age group 18–28 years and 31.5% in the age group 29–39 years. The sample profile also revealed that approximately one third of the sample were secondary school certificate holders, 2.26% Higher National Diploma holders, and 8.14% university degree holders. Degree holders constitute only 2% compared to 12.7% of individuals with less than primary school leaving certificates. The results also indicate that married and bachelor individuals participating in this study were almost equally divided (48.8% and 48.6% respectively).

This investigation also revealed that work-related stress (as reflected by the GHQ-30) was higher among males than females, and among the younger participant sample. That is, there was a positive correlation between job stress and lower age groups. Individual participants with higher levels of education also seem to be vulnerable to work-related stress (as reflected by GHQ-30 mean scores). It was suggested that such findings may be attributed to the specialised and complex nature of work in high positions of the Emergency and Public Safety department and the demanding job responsibilities of high ranking officials. Bachelor staff and divorcees were shown to have the highest levels of work-related stress as reflected by the GHQ-30.

The data reveal statistically significant differences between the level of health issues among the EPS sample members and the demographic variables. There are remarkable differences between the variables of gender, age, educational level, marital status on the one hand, and the amount of job stress on the other.

The survey results demonstrate that the highest percentage of the survey sample according to position (nature of work) has been scored by the fieldworkers (80.5%), followed by the administrators (11.5%), group leaders (4.6%) and at the bottom, sectional heads (3.4%). The data reveal that one third of the respondents have completed less than one year of work for the Emergency & Public Safety department, and 23.2% have spent between 3 and 5 years in service. Also, the results show that 64% of the EPS sample members have not attended any training course. This is viewed as a negative index, which will negatively affect the performance of work due to employees' lack of knowledge and skills. Moreover, lack of training affects the amount of work-related stress and the negative emotions suffered by the employees.

It seems that the heads of sections suffer the highest rates of work-related stress, followed by the fieldworkers, then the administrators, then the group leaders. The greater amount of job stress suffered by the heads of sections may be attributed to the nature of the responsibilities laid upon them to accomplish their tasks and achieve the goals of their sections, supervise and follow-up performance of their staff and help them to overcome the difficulties and problems of work. The survey results also reflect a high volume of work-related pressure among the fieldworkers. This may be attributed to the nature of fieldwork, the shift system, job hazards, incident-handling procedures, in addition to lack of training and lack of participation in training courses.

Overall, it is important to suggest here how crucial and beneficial mental health training programme (i.e, stress management training programmes) design for those vulnerable staff / groups included in this study. Hence this study and as a result would recommend an investment in the development of staff resiliency and stress inoculation programmes designed for a range of vulnerable staff particularly males, young, inexperience staff and those staff who are group leaders and task oriented (working in the emergency field). Other vulnerable staff include those of having more roles and responsibilities in the organisation. Indeed, failure to identify training needs of those task oriented staff and vulnerable groups can lead to STS, fatigue and impact on the total performance and quality service that are delivered by professionals working in emergency department.

In many countries, emergency authority are becoming aware of important of the investment in resiliency development programmes, competency building and skills training to meet the threat of emergency, manmade and natural disasters. Overall, a combination of factors contributes to resiliency. The primary factor in resiliency building include having supportive teamwork relationships within the organisation. Relationships that create trust and provide role models and offer encouragement and reassurance that ultimately help bolster a person's resilience. Other additional factors are associated with resilience building include the capacity to manage strong feelings and impulses as well as a positive view of the self. All of these are factors that people can develop through training programmes. It must be also indicated here that an approach to building resilience that works for one person might not work for another. Hence, some variation may reflect cultural differences. A person's culture might have an impact on how he or she communicates feelings and deals with adversity.

Thematic evaluation of the results

First theme:

'Effective performance of duties and assignments'

1. Have you recently found yourself able to focus your attention on the work you have been doing?
3. Have you recently felt that you are carrying out your responsibilities and undertaking useful roles?
4. Have you recently felt being able to take decisions on various matters?
13. Have you recently been able to occupy most of your time doing something?
11. Have you recently been able to occupy most of your time doing something?
15. Have you recently felt that you have been able to manage your affairs in a satisfactory manner?
16. Have you recently felt that you have been satisfied with the performance of your duties?
22. Have you recently found yourself being able to manage your affairs just like most people undergoing the same circumstances do?

Second theme:

'The feeling of happiness and enjoyment of life'

2.   Have you recently lost a lot of sleep due to anxiety?

5.   Have you recently felt being always tense and strained?

19.   Have you recently felt that you have been nervous and tense all the time?

21.   Have you recently suffered from insomnia and uncomfortable troubled nights?

27.   Have you recently been gripped by unjustified fear and panic?

28.   Have you recently felt that life brings despair?

29.   Have you recently become optimistic about your future?

Third theme:

'Self-confidence'

6.   Have you recently felt that you are unable to overcome your difficulties?

8.   Have you recently found yourself being able to confront your problems with confidence?

10.   Have you recently started to lose confidence in yourself?

14.   Have you recently felt that your leaving the house and interaction with others have become natural or normal?

17.   Have things been getting difficult recently?

18.   Have you recently felt that all things are accumulating over you?

20.   Have you recently found yourself unable to do anything because of tension?

Fourth theme:

'The feeling of fear, anxiety and despair'

7.   Have you recently found yourself being able to enjoy normal daily activities?

9.   Have you recently felt that you are unhappy and depressed?

12.   Have you recently felt a reasonable amount of happiness?

23.   Have you recently found yourself being able to feel affection for those around you?

24.   Have you recently become easy in dealings with others?

25. Have you recently spent long time in conversation with others?

26. Have you recently felt that life is a constant conflict at all times?

30. Have you recently felt that life is not worth living?

CHAPTER 5

DISCUSSION AND CONCLUDING REMARKS

5.0 Introduction

In January 2013, the Secretary-General of the Cooperation Council for the Arab Gulf States (GCC) called for strong regional commitment towards development of a disaster risk reduction strategy to strengthen the resilience of nations and individuals to natural hazards. The Secretary-General of GCC was speaking at a regional workshop on disaster risk reduction entitled Reducing and Managing Disaster Risk and Implementing the Hyogo for Action (HFA) which was hosted by the GCC from 13–16 January in Riyadh in collaboration with UNISDR. Secretary-General Abdul-Latif bin Rashid Al Zayani emphasised the need for a regional culture of safety and the recent conference in Aqaba has emphasised again Hyogo for Action (HFA) (see the attached declaration).

The HFA is a 10-year plan to detail the work required from different sectors and actors to reduce disaster losses by 2015. It was agreed on in 2005 with the many partners needed to reduce disaster risk – including governments, international agencies, disaster experts and many others – bringing them into a common system of coordination. Al Zayani outlined a strategy for disaster risk reduction in the Gulf region with five strategic targets: protecting the security and stability of GCC countries; maintaining sustainable economic growth; achieving comprehensive human development; increasing capacity to deal with crises and disasters; and enhancing regional and international cooperation.

Al Zayani reaffirmed his commitment to such a strategy and expressed his willingness to provide 'security, stability and public safety to GCC countries and their citizens'. Head of UNISDR's Regional Office for Arab States, Amjad Abbashar, stressed that 'the unwavering commitment to disaster risk reduction voiced by the GCC Secretary General will lead to a strengthened systematic engagement of UNISDR with the GCC, its Disaster Management Centre, and its member states'. Abbashar said UNISDR is keen and ready to help the GCC improve their reporting on the Hyogo Framework for Action and to engage Gulf States as regional partners in the ongoing consultations for a new framework in 2015. Abdel Aziz Hamza, Director of the GCC Disaster Management Centre, underlined his commitment to broaden disaster risk reduction efforts in the region by promoting the participation of Gulf States. He emphasised the added value of raising awareness in the Gulf region by mainstreaming disaster risk reduction in schools. He

stated that 'The GCC Disaster Management Centre was established to work towards strengthening Gulf Capacities in DRR.' He emphasised that it would be 'important to promote the use and transfer of advanced technologies and knowledge to address disaster risk reduction and emergencies'. It was also emphasised that the GCC countries are most vulnerable to climate change which particularly affects sea level rise. Qatar, Bahrain and Kuwait are among the most affected in the world by climate change phenomena. Sand storms, storm surges, flash floods and cyclones are other frequent hazards.

It seems that most of the Gulf region have now planned initiatives for the development of disaster risk reduction and included training and quality performance of workforce as a priority. Before discussing the main findings of this study it will be useful to highlight the importance of training and preparation programmes for organisations and departments that are involved in emergency and disaster management.

As highlighted in the earlier part of the results section, emergency staff and rescue workers and all personnel who are involved in dealing with disasters should have some strategic professional training to deal with disasters and emergency particularly in stress inoculation and management, since stress in disaster can exert a lot of pressure on both individuals and teams. Individuals must cope positively and be prepared in such demanding working environment and events. All such training must be mandatory if performance is to be enhanced. Stress management training including secondary traumatisation and post traumatic stress disorder given to the rescue team should focus on the applied behavioural and cognitive skills that are needed to mitigate the effects of stress. Indeed, none of the programmes that have been delivered to staff of the Emergency and Public Safety Administration, AD Police gave much coverage to the impact of stress on performance during disasters. Thus, EPS staff at AD Police should be given access to information on impact of stress on performance in disaster settings. In fact, studies have suggested (Driskell & Salza, 1996) that Stress Inoculation Training (SIT) is the most effective in disasters as it will encompass all aspect of training (especially when paired with initial stages of education). For example, Schuler and colleagues found that the full SIT group improved significantly more than the group receiving SIT without education (Schuler et al., 1982). Driskell and Johnson (1998) also argued that SIT attempts to train coping abilities under stressful conditions by purposely mimicking the conditions of the task in order to train teams to maintain high performance levels despite significant difficulties, while stress exposure training aims at providing trainees with knowledge and familiarity with the stressful environment, the skills needed

for performance and to build self-efficacy which is a stress buffer in stressful events. Overall, very few professionals were trained to deal with emotional trauma.

In addition, studies have also found that stress-reduction techniques enhance performance. Thus, Larsson (1987) argued that performance of the experimental group of conscripts was significantly better than the control group on actual task examinations and mental tests especially when the experimental group had had mental-training techniques such as imagery rehearsal, relaxation and meditation. In support of this, personnel conducting landings who had training in the use of respiratory control also had significantly lower heart rates during the course of two jumps and the stress management group scored higher on performance than the control group (Burke, 1980).

Driskell & Johnson (1998), developed an integrated stress training approach that provides trainees with basic information on stress, stress symptoms and the effects of stress on performance. This training incorporates specialised skills training that can enhance skills required to maintain effective performance in the stressful environment. Driskell & Johnson argued that the stress exposure training needed to allow gradual exposure to the high-stress environment such that skills practice can be promoted under realistic conditions that will build trainees' or personnel's confidence to perform (Driskell & Johnson, 1998). This is supported by Saunders and colleagues who noted that stress exposure training can reduce negative reactions and enhance performance under stress (Saunders et al., 1996).

If skill training improves attention and enhances performance, then it should be noted that the recent Hampshire training which involved police officers and fire-fighters from the UK, other parts of Europe and United Arab Emirates should not have been criticised as a waste of finance, since this is meant to enhance personnel skills to prepare for the worst scenario, should it occur. In this training, top managers argued that it is necessary to be prepared for any catastrophic event. Unfortunately this training was criticised by many people, who said that police should channel their energy in combating crime and not deal with imaginary unlikely scenarios like earthquakes which is waste of resources and finance (*Daily Express*, 10 September 2010).

The exercise was aimed at training a response team to prepare for an unthinkable disaster. This is in line with Mitroff (2001) who suggests that when organisations prepare to handle disaster, they need not only prepare for one type of disaster. Rather, two or more types should be included. Thus, should any disaster happen, the emergency team would be ready to handle it and that it is important to have skilled teams trained and prepared to rescue thousands of victims. In

addition to this, Gick & Holyoak (1987) claimed that the extent to which training results transfer from training settings to real world settings is more likely when a variety of different examples are provided during training. Emergency teams would then be prepared to handle the crisis. The case of the July 2007 bombings was also cited as having caught the emergency teams unaware as they were not trained to deal with the scenario.

The above argument have indciated that a little attention was given to stress management training; and thus is in line with Hancock & Szalma (2008) who documented that incompetent replacement of emergency staff has a negative effect on the ability of members to interact effectively in generating team solutions to problems. Scenario-based training offers a proven instruction strategy that can be used as the guiding frame in designing training for team decision-making within stressful events. In fact, training of team members has been known to influence the amount of perceived stress in teams, thus the impact of the replacement of members on team performance depends on the competence of the replacement (Naylor & Briggs, 1965). This is further supported by Morgan and colleagues who argued that less skilled members have negative impact than competent members who appear to have less positive impact; thus, the higher the percentage of the unskilled replacements the greater the decrease in performance (Morgan et al., 1984).

Therefore, the question remains, should personnel who deal with emergencies and catastrophic events be trained to deal with all types of disaster whether they are likely or not? To further explore this question, research carried out on soldiers found that effective means for enhancing performance of military procedural tasks, such as disassembling and assembling M60 machine guns, was through practice and over-learning (Schendel & Haghman, 1982). In addition to this, it was documented that 100% and 150% over-learning produced moderate to strong effects on performance (Driskell, Willis & Copper, 1992). The exposure to serious physical threats during training has also yielded better training results than training that did not involve such threats only when the soldiers concluded trainings with a feeling of success (Keinan, 1988). It is also vital that personnel who work under extreme pressure or stress undergo skills training as this ameliorates the effect of stress by producing over-learned behaviours. In fact different literatures (Driskell & Salas, 1991; Logan, 1985) have documented that well-rehearsed tasks tend to be less prone to mistakes especially while performing under very extreme stress. This allows personnel to get well acquainted with the tasks such that they become automatic, and require less attention from

individuals, and drilled tasks enhance an individual's sense of predictability and control (Singer et al., 1991, Hancock & Szalma, 2008: 279).

It has also been stated that through training, trainees improve on their self-efficacy and self-confidence and trainees report less anxiety regarding the tasks and the task environment. Trainees also report a greater belief in their own ability to respond to difficult situations. This makes skills-based training effective in situations characterised by high technology or high workload conditions (Ross et al., 2004). Hancock & Szalma (2008) argued that it is important to have stress training as this helps to prepare personnel to maintain effective performance under very high stress operational situations. They also argued that stress training provides pre-exposure to high demand events that may be faced by personnel in the operational environment and provides specialised skills required to maintain effective performance under extreme stress. This has further been supported by Kavanagh (2005) who claims that stress training can moderate the effects of stress on military performance and that attention should focus on developing training that realistically represents the environment that the soldiers are expected to perform in, and should target particular skills and ability to adapt to such situations.

All these types of training require teamwork from all personnel involved. This gives the opportunity for individuals to use their expertise in certain areas while coordinating with the rest of the crew during crisis management. In fact, Flin and colleagues (2009) documented on various measures which involve individuals, team, management-type of training are training that reduces stress and enhance performance. For example, team context has been shown to help overcome the effects of fatigue, workload, time pressure and information load through continuous operations, see Flin (1996).

Training design should incorporate high and low demand task situations, such as sustained operations, complex tasks (emergency response team exhuming bodies from rubble), structured problems, time pressure and others in order to enhance performance. For example, it has been documented that training interventions that include task-specific stressors have been successful in improving performance (Larsson, 1987). This is further supported by various literatures which have also documented promising results in cognitive or behavioural stress-coping training programmes, for example stress management training, anxiety management training and stress inoculation training (Smith, 1980; Suinn, 1990; Meichenbaum 1985). According to Driskell and colleagues, when setting up stress exposure training (SET) it should be borne in mind that the training has to build skills that promote effective performance under stress, to build performance

confidence and to enhance familiarity with the stress environment (Driskell et al., 1992). It is important to develop a solid conceptual foundation for SET methodology in order to apply it to realistic, complex and very stressful environments.

Further, it is important also to train decision-makers in order to avoid potential disruption due to stressors to manage time pressure, distracting levels of noise and high workload. Training programmes should not encourage decision-makers to adopt complex, analytical strategies. However, decision-makers can be trained to handle pressure such as time pressure. This involves learning time management, more systematic approaches to time sensitivity and time management for other personnel. Personnel should be able to do a better job of supporting decision-makers who must work extremely hard in operational settings that are challenging and difficult (Driskell & Salas, 1991).

It is vital to understand the effects of stressors on various types of performance before designing stress training programmes as this enhances performance under extreme conditions. In fact, it was noted that different stressors have different effects and that this varies according to the type of skills being measured (Backer & Orasanu, 1992). Furthermore, it should be noted that when training is inadequate, the complexity of modern police and military systems and the intensity of high-tech battlefield environments increase the overall effect of combat stress on soldiers' performance as well as other rescue personnel, like police officers caught in the battle between hijackers or snipers. In agreement with this, Larsson (1987) documented that personnel who use stress-management strategies during training for complex tasks increased performance compared to those personnel who are not trained with these stress intervention skills. It should be noted that increased training is therefore very beneficial in that it reduces stress effects and individual differences in vulnerability to stress effects. Thus, both physical and performance-related stress should be taken into account as this may affect performance. In addition, it should be noted that experience is generally associated with reduced level of stress which in turn results in higher self-efficacy, due to higher skill levels. Hence, the development of strategies such as mentally preparing oneself for a stressful event will also reduce anxiousness in individuals since they will be ready to take on the tasks. The argument highlighted above has recognised the important of stress management training in resiliency development among emergency staff working in disaster settings.

Focusing on PTSD and secondary traumatisation among professional staff dealing with victims and survivors and in a study on prevalence and size of the PTSD problems among professionals

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and trauma survivors, Galea et al. (2003) carried out a study six months after the 9/11 terrorist attacks. It was revealed the rate of secondary traumatisation stress (STS) and post traumatic stress (PTSD) were high among emergency staff and rescue workers. It was reported that 14.3% of emergency rescue teams who were exposed directly to trauma have suffered PTSD symptoms. Similar rates were found by other research (see Johnson & Thompson, 2008).

Thus, professionals may not resolve their own trauma and their trauma may be activated by reports of similar trauma by victims. Research reporting on traumatised children (Beaton & Murphy, 1987) noted that police officers, emergency personnel, paramedics, fire-fighters, and other emergency workers report that the most vulnerable situation to work in or a situation that affects them most is when they are dealing with children (McCann & Pearlman, 1990a; Dutton & Rubenstein, 1995; Figley, 1995). These effects have been differentiated from general concepts like counter transference and burnout, in that the secondary post-traumatic stress reaction is a response of the therapist to the disclosed characteristics or features of the traumatic event, which was experienced 'directly' by the client (the traumatised person being treated by the therapist).

Generally, STS symptoms include intrusive imagery related to the traumatic events (Courtois, 1988; McCann & Pearlman, 1990), physiological arousal (McCann & Pearlman, 1990; Dutton & Rubenstein, 1995; Figley, 1995), somatic complaints and avoidance responses (Courtois, 1988; Dutton, 1992; Hayley, 1994), addictive or compulsive behaviour (Dutton & Rubenstein, 1995; Figley, 1995a; McCann & Pearlman, 1995). It has been also suggested that the overall distress experienced by professional staff in caring is mediated by risk and resilience factors which include personal characteristics, coping methods and the environment and work settings where the professional works (Dutton & Rubenstein, 1995; Figley, 1995a).

Professionals like rescue workers, fire-fighters, ambulance drivers, paramedics and many others are repeatedly exposed to trauma as a part of their job, particularly those professionals handling dead bodies, treating the injured, and witnessing property and environment loss. Without stress training, this occupational hazard literally puts these professionals at a risk that threatens their emotional well-being, their careers, and their professional and personal lives as well. Indeed, for many of the these professionals their exposure and experience is repetitive, potentially cumulative and makes them vulnerable to a host of problems (Hartsough & Myers, 1985 Stratton et al., 1984).

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Mitchell (1985) suggested that very few caring professionals are trained to deal with the emotional turmoil that follows a traumatic incident. Occupational and organisational hurdles may make the recognition and treatment of STS difficult. For instance: any professional who admits to STS may be questioned as to their work and present and past health; and indeed could ruin their professional career. The failure to treat STS, repeated exposure to trauma and lack of recognition could lead to burnout (Herbison, Rando & Plante, 1978) and impact on quality services that an organisation provides.

Helpers and rescue personnel have more relationship problems and marital discord than the general population (Dunning & Silva, 1980). What can be garnered from the data received from the law enforcement offices and with agencies that work especially with Vietnam veteran families is that prolonged exposure to war and rescue missions has deleterious effects on relationships in both personal and professional lives (Besner & Robinson, 1982; Figley, 1985). As Figley (1985) has noted, families of helpers and crisis personnel are affected by what is termed 'spillover' of the same sources of stress that trouble the helper in the first place. Personality changes like withdrawal into one's own world, isolation and an inability to show affection are common symptoms reported by family members and friends. Spouses and significant others may feel a 'distance' or feel 'shut out' from the helpers because of the nature of their jobs.

Some studies highlight the fact that alcohol consumption may be a way of escape or avoidance of the 'reality' of the traumatic experiences that the helpers face in their jobs (Elder & Clipp, 1988). There have been instances of Vietnam veterans using drugs and alcohol to escape and avoid the symptoms of PTSD.

In summary, it can be concluded that the frequent, repetitive and cumulative exposure to traumatic situations has numerous effects on a professional's personal and work life. However, individual traits like personality of the helper, stress appraisal, organisational/occupational context, social context and community, the severity and length of exposure to traumatic events, the appraisal of death, injury and loss are important factors in understanding how a helper copes with STS and its consequences. Moreover, vulnerable groups emerging from this study and who require supportive training programmes of the above indicated nature included practitioners emergency staff field workers, group leaders with more roles and responsibilities to play in the organisation, the new and inexperience staff, males and divorced staff. According to this study,

less vulnerable staff to stress impacts included the well established experienced emergency staff who were also found to be happy and self confident.

Several theoretical perspectives – e.g. Horowitz (1986); Janoff-Bulman (1992); Foa and Rothbaum (1998) – have discussed STS. For example, Horowitz (1986) was among the first to introduce trauma impacts on individuals' belief and alteration, that is, individuals' views about the self, the larger world and immediate world, the threat of trauma and the future. Indeed, Horowitz (1986) suggested cognitive alteration for recovery from the life threatening event and manifestation of post traumatic stress disorder, and that is why his theory was described as a cognitive theory by many contemporary experts (Brewin & Holmes, 2003). Horowitz (1986) in this particular perspective further explained that the very first response of people to life threatening events is assessment and evaluation of the level of threat to the mind set, often followed by a range of reactions, i.e. physiological and emotional reactions accompany the cognitive processing. Secondly, the person tries to put together the new trauma information with the pre-existing belief system. However, due to information overload and its emotional force, people might not be able to include trauma memories such as images and thoughts into their pre-existing schemas about the self and the world. This contradiction of the information processed results in tension and activation of several defence mechanisms so that the individual can avoid trauma memories and emotional pain. Horowitz (1986) added that people's tendency to integrate trauma experiences with pre-existing ones, that is to integrate old and new information, may itself lead to the intrusion of trauma memories.

Foa and Rothbaum (1998) also advanced the cognitive perspective and suggested that a contradiction in persons' beliefs about the self and the world, and personal experience or training may occur and indeed impose immense changes in people's views they hold about themselves or the world they live in. Similarly, firm beliefs about the self being incompetent and about the world being dangerous would be confirmed by the traumatic occasion, therefore people with such belief alteration are affected more by the traumatic event. Since the self will be conceptualised as weak and incompetent , and the untrained person tries to keep away from traumatic memories, the incapability to process the trauma as it appears further reinforces the critical negative schemas involving incompetence and danger. Moreover, Foa and Rothbaum (1998) argued that the severity of the trauma impairs the cognitive processes of attention and memory at the time of the trauma that is associated with dissociative states and out-of-body experiences. In sum, people's schemas about the self and the world before trauma, the individual's memory records of the

trauma and the individual's memory records of post-trauma experiences are interconnected so that each level reinforces the other. It has been suggested that pre-trauma and trauma records both will influence how post-trauma experiences are interpreted and interpretations of post-trauma experiences will in turn influence schemas about the self and the world. In the view of Janoff-Bulman (1992) the individual's basic cognitive assumptions on the world as safe, kind and worth living in and that the people who surround the individual have good natures and morals will be shattered by threatening life events. Foa et al.'s (1989) model integrates cognitive, learning and personality perspectives of PTSD.

Meanwhile, Ehlers and Clark (2000) paid further attention to the impact of negative evaluations of the traumatic event and a diversity of surviving methods that play a role in the path of the disorder. These researchers argued that despite the fact that the traumatic event was in the past, people with PTSD are not able to perceive the threat as being an event of the past. For that reason people with PTSD go through the trauma related information in a sense that brings up the past as an existing threat, which might be either an external threat to their safety or an internal threat to their selves and the future. Ehlers and Clark (2000) suggested some traumatised individuals tend to over-generalise the negative threat and link it to the present and future of their action. These negative evaluations, involving danger or violation of standards of the self are strongly associated to emotion reported by people with PTSD. Ehlers and Clark (2000) also indicated that a sense of helplessness or individual mental defeat is a risk factor of future PTSD or STS traumatisation.

Overall, GHQ scores seems to indicate that the majority of the sample were not only competent , well trained with local and international involvements but regarded themselves as happy, well performing , not anxious and self confidence.

It should be noted here that PTSD and STS are complex reactions associated with changes in physiology, behaviour, cognition and emotion, and genetic influence on PTSD has been studied in a variety of aspects of the disorder. Several studies suggest that some genetic factors might predispose individuals to develop PTSD after traumatic events (Keane, Marshall, & Taft, 2006; Stein et al., 2002). Family studies found increased liability to PTSD for parents whose child developed PTSD and for children whose parents developed PTSD (Koenen, 2007). Yehuda (2001) showed that adult children of parents of Holocaust survivors were more likely to develop PTSD than the adult children of parents without PTSD. A more recent study with identical and fraternal twins found genes accounted for the 33% of the risk in developing PTSD (Koenen et al.,

2007). It is, thus, better to consider genetics as a vulnerability factor for PTSD and question how genetics interact with trauma and environment.

Numerous studies (Cunningham, 2003; Way et al., 2004, Herman, 1992) have also indicated that reduction of STS symptoms, compassion fatigue or burnout may be overcome through specialised training, organisation acknowledgement, support, individuals' balancing caseloads and supervision so that professionals can understand STS impacts (Cairns, 207). Figley (1995a) has suggested in numerous studies that compassion fatigue and secondary traumatic stress may be used interchangeably. Figley has indicated that compassion fatigue is the result of professionals with a strong empathic orientation working with highly traumatised individuals (Figley, 1995b; Adams, Boscarino & Figley, 2006). Figley (2002; Figley 1995a) strongly believes that the role of empathy is an important component in the conceptualisation of both secondary traumatic stress and compassion fatigue. Sabo (2006) and others (Pfifferling & Gilley, 2000) seem to support the notion that cumulative, prolonged exposure, lack of support and lack of acknowledgement and/or poor training contribute to STS reactions and compassion fatigue among healthcare providers and emergency staff helping or wanting to help traumatised individuals. It should be indicated here that secondary traumatic stress may affect any helping worker who deals with traumatised individuals, including nurses, emergency staff, police officers and other workers who provide care for victims of sexual assault (Pearlman & Saakvitne, 1995a). Cornille and Meyers (1999) and Nelson-Gardell and Harris (2003) studied front-line social workers and workers in child protection units and child abuse cases who were found to display STS reactions. Secondary traumatic stress is regarded as cumulative or acute exposure to traumatic material, and has been indicated to be an occupational hazard for those working with traumatised individuals (Figley, 1999).

Beaton and Murphy (1995) have reported that there is a positive correlation between STS responses and large caseloads, long working hours and increased contact with traumatised patients. A meta–analysis study conducted by Figley (1995a) categorised the reactions of STS into the following: (a) emotional distress such as sadness, shame, grief, depression and anxiety (McCann & Pearlman, 1990a; Harbert & Hunsinger, 1991; Clark & Gioro, 1998); (b) cognitive shift and poor relationships and (c) nightmares, flashbacks, disturbing images (Figley 1995b; Stamm, 1995; McCann & Pearlman, 1990; Herman, 1992), insomnia, hyper-vigilance (Davis, 1996) and poor social interaction and lack of appreciation (Dutton & Rubenstein, 1995). These symptoms are widely reported by those who study PTSD reactions (Hosin, 2007; Lubit, 2007).

As indicated above (Horowitz, 1986) cognitive shifts include the shifts in the beliefs, expectations and assumptions that professionals working with traumatised victims hold. McCann and Pearlman (1990) suggested that these cognitive shifts include suspicion of others, sense of vulnerability and strong sense of helplessness and guilt feeling (see Herman, 1992; Dutton and Rubinstein, 1995). This may result in withdrawal from family, friends or colleagues (Harbert & Hunsinger 1991). Dutton & Rubinstein (1995) have also indicated that trauma workers who become overloaded by traumatic matters are at best ineffective and at worst place the survivors in the position takeoff taking care of the helper.

It does seem these psychological reactions ST symptoms among professional staff working with traumatised patients occurs (but have not materialised in the GHQ scores of this study) regardless of race, gender, age or level of training (Rudolph et al., 1997). Hence large caseloads, increased contact with clients and long working hours are likely to be risk factors. Hence, a vital variable linked with risk of STS is level of professional experience (Neumann & Gamble, 1995). Less experienced employee therapists have been reported (elsewhere and in this study) to have higher levels of psychological distress and increased STS reactions than employees or therapists with more experience (Chrestman, 1999; Follette et al., 1994; Way et al., 2004). Contrary to the major findings of this study on the level of experience reported earlier, Birk (2002) discovered that the more years working with trauma increased the level of compassion fatigue and burnout. Wee and Myers (2002) carried out research with mental health professionals working in disaster services in Oklahoma City. They found that higher risk of STS and burnout was linked with increased time working with survivors of the bombing. Other risk factors proposed by Figley (1995a, 2002a) and others (Ortlepp & Friedman, 2001) include empathetic capability, empathetic reaction, exposure to the patient, compassion stress, sense of achievement, prolonged exposure, traumatic recollections, and life disruptions (Figley, 2002a). Dutton and Rubinstein (1995) put forward a model for secondary traumatic stress that contains four different risk factors namely level of previous exposure, professional reactions to previous trauma, coping strategies, and the personal and environmental mediators of STS responses (Dutton & Rubinstein, 1995; Ortlepp & Friedman, 2001). Beaton and Murphy (1995) have also put forward a similar perspective and include organisational components such as role conflict, cultural norms and size of the organisation (Beaton & Murphy, 1995). Additionally, Beaton & Murphy (1995) look at mediating components such as training, social support and experience.

Personal life stressors or personality factors have been reported to add to STS. Dutton and Rubinstein (1995) have indicated that personality variables such as a therapist's self-esteem, ego strength and individual resource capability can affect vulnerability to STS (Pearlman & Saakvitne, 1995a). Care providers with high levels of stressors in their personal lives (being divorced or widowed in this particular study) or those who have a negative copying style tend to be at greater risk for secondary traumatic stress (Follette et al., 1994; Schauben & Frazier, 1995). Active coping styles like construction of an action plan to resolve issues have been found to lessen STS reactions in those professionals who are able to adopt them (Schauben & Frazier, 1995).

Indeed, effective coping styles prevent STS reactions. Among these are clear boundaries between home and work and taking part in regular physical activity that helps one to relax and promotes physical health. Furthermore, taking time off work, listening to music, pursuing hobbies and meditation are recommended coping methods (Pearlman & Saakvitne, 1995b; Schauben & Frazier, 1995). Techniques such as limiting exposure to traumatic material are also recommended. Norcross (2000) wrote that important self-care strategies for professionals working with traumatised individual are diversifying and balancing their patient caseloads. STS might be prevented if the caseload has an appropriate balance of patient issues (trauma and non-trauma), kinds of therapy (group, families, individual and couples) and other professional methods (supervision, teaching, research, and writing) (Pearlman & Saakvitne, 1995a). Pearlman & Saakvitne (1995a) also indicated that it is vital to foster relationships with other workers for support. Staying connected with traumatised patients, utilising support groups which was lacking among participants of this study, attending workshops, and sharing coping methods with other therapists are also useful means of handling STS. Self-care is a crucial part of prevention of STS. A study of 117 trauma therapists carried out by Pearlman and Maclan (1995) found at least one third of the participants felt that socialising, exercising, and spending time with family and friends were helpful in coping with traumatic material. Additional methods were engaging in social justice activities and having a massage. Wee and Myers (2002) list personal stress management activities in their research of mental health professionals after a disaster happened. These include leisure and diversion activities such as dinner, social activities, reading, and spending time outdoors. Other self-care strategies included family time, exercise, relaxation, meditation, informal group therapy with co-workers, and personal counselling and prayer (Wee & Myers, 2002). Unfortunately , the sample used in this study and despite their prior professional training had no strategic stress/ mental health training that would promote resiliency and decrease vulnerability to STS.

Still focusing on coping and support, several studies (Kadambi & Truscott, 2003; Schauben & Frazier, 1995) have noted that having a support system can decrease the impact of working with patients who have experienced trauma. This outlet may be colleagues and supervisors rather than friends or family members. Schauben and Frazier (1995) found that therapists in their sample who indicated that they actively sought social support had lower levels of STS than those who did not. Perceived social support with others was also reported (Ennis and Home, 2003) to be connected with lower levels of PTSD related symptoms. Perceived social support is the knowledge that professionals have supportive colleagues in the workplace. Seeking personal psychotherapy and other forms of social and emotional support may help decrease STS (Ennis & Home, 2003; Follette et al., 1994; Herman, 1992).

Similarly, insufficient peer support, a lack of respect for patients and therapists and poor physical safety can increase staff susceptibility to secondary traumatic stress (see Dutton & Rubinstein, 1995; Pearlman & Saakvitne, 1995b). Brady et al. (1999: 38) clearly suggested that organisations can help decrease STS by giving an emotionally supportive, physically safe and consistently respectful work environment. Other components that can decrease the negative impact of STS include holiday, leave, satisfactory pay, and other work conditions including providing sick leave. Research suggested that organisations should also develop competent trauma specific supervision, training, consultation and continuous professional development available for all staff (Pearlman & Saakvitne, 1995a; Cerney, 1995; Yassen, 1995, Cornille & Meyers, 1999). Other protective factors in STS include spirituality (Brady et al., 1999; Dane, 2000; Pearlman & Saakvitne, 1995,ab) and resiliency. Spirituality here means having a clear explanation of purpose and meaning in life. Dane (2000) found that spirituality was a vital coping mechanism utilised by professionals to help them find meaning in their job. Therapists who do not have a clear view of life and causality and struggle with problems of meaning in life, purpose and spirituality might be at risk for secondary traumatic stress.

Cornille and Meyers (1999) and Follette et al. (1994)suggested that it is important for organisations to offer professional training to their staff to enable them to identify and predict STS reactions. Secondary traumatic stress reactions need to be normalised and professionals need to be aware of personal factors affecting STS such as personal history of trauma, coping techniques and work environment (Pearlman and Saakvitne, 1995).

5.1 Addressing core aims, conclusion, limitations and future work

This research project has taken a psychological approach to the assessment and evaluation of emergency staff performance and their coping with stress during disaster. It was designed to investigate in the first instance the professional stress level among emergency team members; and then identify core skills that are needed for staff performance working in various emergency response teams particularly those who work in police settings.

With stress level in mind, it was hypothesised that emergency response team members are likely to manifest (display) high level of stress. Hence their stress threshold level and performance are likely to be determined by nature of the work, demands, motivation and age and/or staff experience. The outcomes of this study (GHQ scores) did not support the above indicated hypothesis.

Other questions that are addressed in this investigation are relevant to safety and existing emergency roles or protocol as well as continuing education programmes and training and hence their relation to performance. The main results of this study found the training of the staff participated in this study were well established but not those programmes that are devoted to STS and/or mental health of staff working in emergency settings..

The investigation involved a sample of those who respond to emergency or disasters and those who may engage in potential rescue efforts in Abu Dhabi. These include search and rescue teams, emergency medical and health care workers, disaster and civil defence planners, and those who involve in relief services.

As well as highlighting the main aims and objectives here, other issues which will be discussed in depth in the remaining part of the thesis include individual differences, stress and coping during disasters, disaster management and other relevant issues related to performance, skills development and training. Initial results of this study show that more than half of the surveyed sample (62.5%) were in the age group of 18–28 years, followed by 31.5% in the age group 29–39 years. Participants of older age constituted a rather small percentage. Other results suggested that female participants working in Emergency and Public Safety represented 4.3% of the participants included in this study. The majority of the participants were males holding appropriate relevant HE education (95.7%), with 80.5% of the sample involved in daily fieldwork such as involvement in ambulance emergency work or participation in the rapid intervention as well as

international rescue mission activities and/or other relevant emergency matters including participation in manmade and natural disasters.

Further, the results of this study clearly indicate that more than half of the sample of staff working at the Emergency and Public Safety Administration (EPS), Abu Dhabi Police GHQ are satisfied with the training and efficiency of the equipment or tools they use for their daily duties. More than half of the sample (62.3%) who were included in this study view their preparations as appropriate and good. Further 14.8% (n = 80) declared that their preparedness to the service is excellent. Results of local and international participation indicated that 73.8% of previous participation of the sample members was local; while over a quarter of the sample (26%) had involvement in international missions.

Other outcomes presented in this study show that the males in the study sample scored higher levels of work-related stress compared to their female colleagues – mean score of male participants was 2.2176 compared to females' score of 2.0130. When work position was calculated and included in the analysis as a variable, it was found that the heads of sections and main fieldworker participants (these two subgroups) scored higher on the GHQ (M = 2.3833; 2.3155 respectively), followed by admin and other staff (M = 2.1784 and 2.1387, respectively).

As expected, results show that new and inexperienced EPS staff members (with less than 1 year of service) are likely to score higher on the GHQ (mean score 2.5359). Furthermore, it seems fair to suggest that relevant experience is an important protective factor from the relevant work-related occupational stress as reflected by the GHQ scores. Work-related vulnerability to stress may be due to lack of experience and important skills that are required in the field of rapid intervention and response such as ambulance services or in fire-fighting which involve a high degree of risk during action. Similarly results show that experience gained through training can contribute to skills development, performance and buffer individuals from vulnerability and work-related stress as reflected by the GHQ scores. More specifically, results indicated that individual staff of EPS included in this study, particularly those who participated in prior specialised emergency training programmes, score lower on GHQ than their counter group participants who had no prior emergency staff development training. Apart from vulnerability to work-related stress, lack of staff development training is more likely to influence negatively performance and perhaps contribute to poor job satisfaction. Level of education and vulnerability to stress among participants as reflected by the GHQ mean score was also significantly important. Widowed and

divorced staff were more vulnerable to stress than their counterparts, the single and the married staff members.

It seems many organisations still do not understand the systematic nature of disaster and its psychological impact on performance. However, very few countries or organisations have understood the importance of building a comprehensive infrastructure and mental training programme to meet the challenges of staff performance in emergency or disasters. Throughout the discussion of the literature provided, it has been noted that the majority of the programmes provided in training (included those of local were lacking input on stress inoculation, resiliency development, performance and disaster management. Most of the disaster management programmes are just add-ons or afterthoughts. It is important that organisations or countries prepare their workforce and material infrastructure to combat (or manage) disaster whatever the magnitude of disasters may be.

The highlighted discussion also noted that only a few countries have learned the importance of preparing for a broad range of needs in disasters. All countries should be prepared and be at the forefront of training for disaster preparedness. However, the challenge still remains that only few countries have learnt the necessity of building and maintaining a broad-based disaster or crisis portfolio; and only a small number have developed adequate signal detection mechanisms for disaster prevention. It is also important for countries – including the UAE which this research project focused on – to carry out regular training for their staff and deliver extensive courses on stress, resiliency development, performance and disasters which hardly appeared in the menu of annual training for the years 2011–2013 presented in the appendix and the result section of this study.

As indicated, planning is very important in managing disaster. It is therefore important to learn lessons from those countries that have already experienced major crises and disasters, including how well they handled it, or how they failed to tackle it appropriately. Many lessons can be learned from disasters such as the Chernobyl Nuclear Power plant disaster that occurred on the 26 April 1986 or the BP oil spill in the Gulf of Mexico.

Similarly, the Fukushima Daiichi nuclear disaster was a result of a series of equipment failures, nuclear meltdowns leading to the release of radioactive materials at the Fukushima Nuclear Power Plant, following the Tōhoku earthquake and tsunami on Friday 11 March 2011. This disaster was the largest nuclear disaster since Chernobyl in 1986, and only the second disaster

(along with Chernobyl) to measure Level 7 on the International Nuclear Event Scale. It was caused by an earthquake which was the largest earthquake in recorded history which occurred on the east coast of northern Japan. This earthquake generated a major tsunami, causing nearly 20,000 deaths. Electricity, gas and water supplies, telecommunications and railway services were all severely disrupted and in many cases completely shut down. These disruptions severely affected the Fukushima Daiichi nuclear power plant, causing a loss of all on-site and off-site power and a release of radioactive materials from the reactors.

The Fukushima Daiichi nuclear plant used to comprise six separate boiling water reactors originally designed by General Electric (GE), and maintained by the Tokyo Electric Power Company (TEPCO). At the time of the earthquake, Reactor 4 had been de-fuelled while 5 and 6 were in cold shutdown for planned maintenance. Immediately after the earthquake, the remaining reactors 1–3 shut down automatically, and emergency generators came online to power electronics and coolant systems. However, the tsunami following the earthquake quickly flooded the low-lying rooms in which the emergency generators were housed. The flooded generators failed, cutting power to the critical pumps that must continuously circulate coolant water through a nuclear reactor for several days in order to keep it from melting down after being shut down. As the pumps stopped, the reactors overheated due to the normal high radioactive decay heat produced in the first few days after nuclear reactor shutdown (smaller amounts of this heat normally continue to be released for years, but are not enough to cause fuel melting).

Focusing on cost and damage, in November 2011, the Japanese Science Ministry reported that long-lived radioactive caesium had contaminated 11,580 square miles (30,000 sq km) of the land surface of Japan. Some 4,500 square miles – an area almost the size of Connecticut – was found to have radiation levels that exceeded Japan's allowable exposure rate of 1 mSV (millisievert) per year.

However, all of the land within 12 miles (20 km) of the destroyed nuclear power plant, encompassing an area of about 230 square miles (600 sq km), and an additional 80 square miles (200 sq km) located northwest of the plant, was declared too radioactive for human habitation. All persons living in these areas were evacuated and the regions were declared to be permanent 'exclusion' zones.

The precise value of the abandoned cities, towns, agricultural lands, businesses, homes and property located within the roughly 310 sq miles (800 sq km) of the exclusion zones has not been

established. But estimates of the total economic loss range from 250–500 billion US dollars (see the Web link retrieved on 10 February 2013: http://truth-out.org/news/item/12832-costs-and-consequences-of-the-fukushima-daiichi-disaster).

It is important to emphasise here and one more time that emergency staff mental wellbeing, stress management training in disaster and investment in human and material infrastructure are crucial issues. This is to meet the challenges of disasters such as those described above. Unfortunately many countries have not invested – perhaps due to resource limitations – in resiliency development, competencies and skills training; or in the material infrastructure to meet the threat of manmade and natural disasters. However, the most vulnerable groups that are participated in this study - as the main result suggested- include males, young, inexperience staff and those who are group leaders and task oriented (working in the emergency field). Other vulnerable staff include those of having more roles and responsibilities in the organisation. Furthermore, It should be indicated here that failure to identify training needs of those task oriented staff and vulnerable groups can lead to STS, fatigue and impact on total performance; and quality service that are provided by professionals working in emergency department.

Additionally, large organisations such as those of ADP would benefit from licensed mental health professionals. That is occupational or health psychologists who would not only provide training but assist people in developing an appropriate strategy to deal with fatigue, burnout and serious secondary traumatisation symptoms. It is important to get professional help when staff feel unable to function or perform basic activities of daily living as a result of a traumatic or other work related stressful life experience.

REFERENCES

Aarts, P. G. & Op den Velde, W. (1996). Prior traumatization and the process of aging: Theory and clinical implications. In B. A. van der Kolk, A. C. McFarlane & L. Weisaeth (eds.), *Traumatic Stress: The Effects of Overwhelming Experience on Mind, Body, and Society*. New York: Guildford Press, 359–77.

Ackerley, G. D., Burnell, J., Holder, D. C. & Kurdek L. A. (1988). Burnout among licensed psychologists. *Professional Psychology: Research and Practice*, 19: 624–63.

Adams, K. B., Boscarino, J. A. & Figley, C. R. (2006). Compassion fatigue and psychological distress among social workers: a validation study. *American Journal of Orthopsychiatry*, 76(1): 103–8.

Adams, K. B., Matto, H. C. & Harrington, D. (2001). The Traumatic Stress Institute Belief Scale as a measure of vicarious trauma in a national sample of clinical social workers. *Families in Society: The Journal of Contemporary Human Services*, 82 (4): 363–71.

Adams, K. B. & Riggs, S. A. (2008). An exploratory study of vicarious trauma among therapist trainees. *Training and Education in Professional Psychology*, 2 (1): 26–34.

Adams, R. E., Figley, C. R. & Boscarino, J. A. (2004). *Compassion Fatigue and Psychological Distress among Social Workers: A Validation Study of a Secondary Trauma Instrument*. New York: New York Academy of Medicine.

Ader, R. & Cohen, N. (1975). Behaviourally conditioned immuno-suppression. *Psychosomatic Medicine*, 37: 333–40.

Albala–Bertrand, J. M. (1994). *The Political Economy of Large Natural Disasters: With Special Reference to Developing Countries*. Oxford: Clarendon Press.

Aldwin, C. (2007). *Stress, Coping, and Development*, 2nd edition. New York: Guilford Press.

Aldwin, C. M. & Yancura, L. A. (2004). Coping and health: a comparison of the stress and trauma literatures. In P. Schnurr & B. Green (eds.), *Trauma and Health: Physical Health Consequences of Exposure to Extreme Stress*. Washington, DC: American Psychological Association, 99–125.

Alexander, D. (1997). The study of natural disasters, 1977–1997: some reflections on a changing field of knowledge. *Disasters*, 21 (2): 284–304.

American Psychiatric Association (APA)_(2000). *Diagnostic and Statistical Manual of Mental Disorders*, 4th edn., text revised. Washington, DC: APA.

Anderson, M. B. (2000). *The Impacts of Natural Disasters on the Poor: A Background Note*. Submitted to Cornell University under Consulting Agreement 35113–9382 for the World Bank. http://www.worldbank.org/poverty/wdrpoverty/background/anderson.pdf

Anderson, M. B. & Woodrow, P. (1989). *Rising from the Ashes: Development Strategies in Times of Disaster*. Boulder: Lynne Rienner.

Annan, K. (1999). *Facing the Humanitarian Challenge: Towards a Culture of Prevention*. Report on Work of Organization. New York: United Nations.

Anon (1989). *Webster's Encyclopedic Unabridged Dictionary of the English Language*. New York: Gramercy.

Antonovsky, A. (1987). *Unravelling the Mystery of Health: How People Manage Stress and Stay Well*. San Francisco: Jossey-Bass.

Argentero, P. & Setti, I. (2011). Engagement and vicarious traumatization in rescue workers. *International Archives of Occupational Environmental Health*, 84: 67–75.

Arvay, M. J. (1999). Narratives of secondary traumatic stress: stories of struggle and hope. *Dissertation Abstracts International Section A: Humanities and Social Sciences*, 59 (12-A): 4365.

Arvay, M. J. (2001a). Secondary traumatic stress among trauma counselors: what does the research say? *International Journal for the Advancement of Counseling*, 23 (4): 283–93.

Arvay, M. J. (2001b). Shattered beliefs: reconstructing the self of the trauma counsellor. In R. A. Neimeyer (ed.), *Meaning Reconstruction & the Experience of Loss.* Washington, DC: American Psychological Association, 213–30.

Asian Development Bank (ADB) (1992). *Disaster and Mitigation in Asia and the Pacific.* Manila: ADB.

Astin, M. C. (1997). Traumatic therapy: how helping rape victims affects me as a therapist. *Women and Therapy*, 20 (1): 101–9.

Auerbach, S. M., Martelli, M. F. & Mercuri, L. G. (1983). Anxiety information, interpersonal impacts and adjustment to a stressful health care, situation. *Journal of Personality and Social Psychology*, 44: 1284–1296.

Bandura, A. (1997). Self-efficacy: The exercise of control. New York: Freeman..

Backer, P. R. & Orasanu, J. M. (1992). *Stress, Stressors and Performance in Military Operations: A Review* (Contract No. DAAL05-86-D001). Alexandria, VA: Army Research Institute.

Badger, J. M. (2001). Understanding traumatic stress. *American Journal of Nursing*, 101 (7): 26–33.

Baird, S. & Jenkins, S. R. (2003). Vicarious traumatization, secondary traumatic stress, and burnout in sexual assault and domestic violence agency staff. *Violence and Victims*, 18 (1): 71–86.

Baird, S. & Kracen, A. C. (2006). Vicarious traumatization and secondary traumatic stress: a research synthesis. *Counselling Psychology Quarterly*, 19 (2): 181–8.

Bandura, A. (1969). *Principles of Behavior Modification.* New York: Holt, Rinehart and Winston.

Baron, J. (1993). Judgement and decision analysis for decision support system design (Symposium summary). *Proceedings of the Human Factors and Ergonomics Society 37th Annual Meeting.* Santa Monica, CA: Human Factors Society.

Banerjee, M. M. & Gillespie, D. F. (1994). Linking preparedness and organizational disaster response effectiveness. *Journal of Community Practice,* 1 (3): 129–42.

Baum, N. (2010). Shared traumatic reality in communal disasters: toward a conceptualization. *Psychotherapy, Research, Practice, Training,* 47 (2): 249–59.

Baum, N. (2012a). Emergency routine: the experience of professionals in a shared traumatic reality of war. *British Journal of Social Work,* 42 (3): 424–42.

Baum, N. (2012b). Trap of conflicting needs: helping professionals in the wake of a shared traumatic reality. *Clinical Social Work Journal.* 40 (1): 37–45.

Bauwens, J. & Tosone, C. (2010). Professional posttraumatic growth after a shared traumatic experience: Manhattan clinicians' perspectives on post-9/11 practice. *Journal of Loss and Trauma,* 15 (6): 489–517.

Beatley, T. (1995). Promoting sustainable land use: mitigating natural hazards through land use planning. In *Natural Disasters: Local and Global Perspectives, Boston: Insurance Institute for Property Loss Reduction.*

Beaton, R. D. & Murphy, S. A. (1995). Working with people in crisis: research implications. In C. R. Figley (ed.), *Compassion Fatigue: Coping with Secondary Traumatic Stress Disorder.* New York: Routledge, 51–81.

Bell, H. (2003). Strengths and secondary trauma in family violence work. *Social Work,* 48 (4): 513–22.

Bennett, M. K., Hughes, G. M. & Smith, P. T. (2005). Psychological response to later life widowhood: coping and the effects of gender. *Omega: Journal of Death and Dying*, 51: 33–52.

Beven, Jack (2012). Tropical Storm Sandy Discussion Number 7 (Report), 24 October. National Hurricane Center. http://www.nhc.noaa.gov/archive/2012/al18/al182012.discus.007.shtml (accessed 24 October 2012).

Billings, A. G. & Moos, R. H. (1984). Coping, stress, and social resources among adults with unipolar depression. *Journal of Personality and Social Psychology*, 46: 877–91.

Blaikie, P., Cannon, T., Davis, I. & Wisner, B. (1994). *At Risk: Natural Hazards, People's Vulnerability and Disasters*. London and New York: Routledge.

BMZ (2001). *Poverty Reduction: A Global Responsibility. Program of Action 2015. The German Government's Contribution Towards Halving Extreme Poverty Worldwide*. Bonn: Federal Ministry for Economic Cooperation and Development.

Bober, T. & Regehr, C. (2006). Strategies for reducing secondary or vicarious trauma: Do they work? *Brief Treatment and Crisis Intervention*, 6: 1–9.

Borritz, M. & Kristensen T. (1999). PUMA: study on personal burnout, work burnout and client burnout. Copenhagen: National Institute of Occupational Health.

Borritz, M. & Kristensen T. (2004). Burnout Inventory: results from the PUMA study on personal burnout, work burnout and client burnout. Copenhagen: National Institute of Occupational Health.

Boscarino, J. A., Figley, C. R. & Adams, R. E. (2004a). Compassion fatigue following the September 11 terrorist attacks: a study of secondary trauma among New York City social workers. *International Journal of Emergency Mental Health*, 6: 57–66.

Boscarino, J. A., Galea, S., Adams, R. E., Ahern, J., Resnick, H. & Vlahov, D. (2004b). Mental health services and psychiatric medication use following the terrorist attacks in New York City. *Psychiatric Services*,55: 274–83.

Boscarino, J. A., Galea, S., Ahern, J., Resnick, H. & Vlahov, D. (2002). Utilization of mental health services following the September 11th terrorists attacks in Manhattan, New York City. *International Journal of Emergency Mental Health*, 4: 143–55.

Boudreaux, E., Kilpatrick, D. G., Resnick, H. S., Best, C. L. & Saunders, B. E. (1998). Criminal victimization, posttraumatic stress disorder, and comorbid psychopathology among a community sample of women. *Journal of Traumatic Stress*, 11 (4): 665–78.

Brady, J. L., Guy, J. D., Poelstra, P. L. & Brokaw, B. F. (1999).Vicarious traumatization, spirituality, and the treatment of sexual abuse survivors: A national survey of women psychotherapists. *Professional Psychology: Research and Practice*, 30: 386–93.

Breslau, N. (1998). Epidemiology of trauma and posttraumatic stress disorder. In R. Yehuda (ed.), *Psychological Trauma*. Washington, DC: American Psychiatric Press, 1–29.

Breslau, N. & Anthony, J. C. (2007). Gender differences in the sensitivity of posttraumatic stress disorder: An epidemiological study of urban young adults. *Journal of Abnormal Psychology*, 116 (3): 607–11.

Breslau, N., Chilcoat, H. D., Kessler, R. C., Peterson, E. L. & Lucia, V. C. (1999). Vulnerability to assaultive violence: further specification of the sex difference in post-traumatic stress disorder. *Psychological Medicine*, 29: 813–21.

Breslau, N., Davis, G. C., Andreski, P., Peterson, E. L. & Schultz, L. (1997). Sex differences in posttraumatic stress disorder. *Archives of General Psychiatry*, 54 (11): 1044–8.

Brewin, C. R., Andrews, B., Rose, S. & Krik, M. (1999). Acute stress disorder and posttraumatic stress disorder in victims of violent crime. *American Journal of Psychiatry*, 156 (3): 360–6.

Brewin, C. R., Andrews, B. & Valentine, J. D. (2000). Meta-analysis of risk factors for posttraumatic stress disorder in trauma-exposed adults. *Journal of Consulting and Clinical Psychology*, 68 (5): 748–66.

Bride, B. E. (2004). The impact of providing psychosocial services to traumatized populations. *Stress, Trauma, and Crisis: An International Journal*, 7 (1): 29–46.

Bride, B. E. (2007). Prevalence of secondary traumatic stress among social workers. *Social Work*, 52(1): 63–70.

Bride, B. E., Radey, M. & Figley, C. R. (2007). Measuring compassion fatigue. *Clinical Social Work Journal*, 35: 155–63.

Bride, B. E., Robinson, M., Yegidis, B. & Figley, C. (2004). Development and validation of the Secondary Traumatic Stress Scale. Research on Social Work Practice, 14: 27–35.

Briere, J. (1995). *Trauma Symptom Inventory: Professional Manual*. Odessa, FL: Psychological Assessment Resources.

Briere, J. & Elliott, D. M. (1998). Clinical utility of the impact of event scale: psychometrics in the general population. *Assessment*, 5(2): 171–80.

Bryant, R. & Harvey, A. (1996). Posttraumatic stress reactions in volunteer firefighters. *Journal of Traumatic Stress*, 9: 51–63.

Buckley, T. C., Blanchard, E. H. & Hickling, E. J. (1998). A confirmatory factor analysis of posttraumatic stress symptoms. *Behaviour Research and Therapy*, 36: 1091–9.

Bukalew, L. W. (1988). *Soldier Performance as a Function of Stress and Load: A Review*. Alexandria, VA: Army Research Institute.

Burgess, A. W. & Holmstrom, L. L. (1983). Rape trauma syndrome. *Behavioral Sciences and the Law*, 1 (3): 97–113.

Burke, W. P. (1980). *An Experimental Evaluation of Stress Management of Training for Airborne Soldier* (Tech. Rep. No. 550). Alexandria, VA: Army Research Institute (ERIC Document Reproductive Services No. ED 242-928).

Cairns, K (2007). Caring fro the carers: Preventing and managing secondary   traumatic stress. In Hosin, A . Responses to Traumatized Children. Palgrave Macmillan.

Callahan, J. (1996). Social work with suicidal clients: challenges of implementing practice guidelines and standards of care. *Health & Social Work*, 21: 277–85.

Cameron, C. (1994). Veterans of a secret war. *Journal of Interpersonal Violence*, 9 (1): 117–33.

Campbell, D. T. & Fiske, D. W. (1959). Convergent and discriminant validation by the multitrait-multimethod matrix. *Psychological Bulletin*, 56: 81–105.

Canfield, J. (2005). Secondary traumatization, burnout, and vicarious traumatization: a review of the literature as it relates to therapists who treat trauma. *Smith College Studies in Social Work*, 75 (2): 81–101.

Cannon-Bowers JA, Salas E, eds. (1998).Making decisions under stress: Implications for Individual and team training. Washington, DC: American sychological Association

Carlson, E. B. & Dalenberg, C. J. (2000). A conceptual framework for the impact of trauma experiences. *Trauma, Violence, & Abuse*, 1 (1): 4–28.

Carone, D. A. & Barone, D. E (2001). A social cognitive perspective on religious beliefs: their functions and impact on coping and psychotherapy. *Clinical Psychology Review*, 21: 989–1003.

Carroll, E. M., Rueger, D. B., Foy, D. W. & Donahoe, Jr., D. P. (1985). Vietnam combat veterans with posttraumatic stress disorder: analysis of marital and cohabitating   adjustment. *Journal of Abnormal Psychology*, 94 (3): 329–37.

Chambers, R. (1989). Vulnerability, coping and policy. *Institute of Development Studies Bulletin*, 20: 1–7.

Chemtob, C. M., Bauer, G. B., Hamada, R. S., Pelowski, S. R. & Muraoka, M. Y. (1989). Patient suicide: occupational hazard for psychologists and psychiatrists. *Professional Psychology: Research and Practice*, 20: 294–300.

Chemtob, C. M., Hamada, R. S., Bauer, G., Torigoe, R. Y. & Kinney, B. (1988). Patient suicide: frequency and impact on psychologists. *Professional Psychology: Research and Practice*, 19: 416–20.

Chochinov, H. M., Wilson, K. G., Enns, M. & Lander, S. (1997). Are you depressed? Screening for depression in the terminally ill. *The American Journal of Psychiatry*, 154: 674–6.

Chrestman, K. R. (1995). Secondary exposure to trauma and self reported distress among therapists. In B. H. Stamm (ed.), *Secondary Traumatic Stress: Self-Care Issues for Clinicians, Researchers and Educators*. Lutherville, MD: Sidran Press, 37–47.

Chrestman, K. R. (1999). Secondary exposure to trauma and self-reported distress among therapists. In B. H. Stamm (ed.), *Secondary Traumatic Stress: Self-Care Issues for Clinicians, Researchers and Educators*, 2nd edn. Lutherville, MD: Sidran, 29–36.

Christensen, A. (1988). Dysfunctional interaction patterns in couples. In N. Noller & M. A. Fizpatrick (eds.), *Perspectives on Marital Interaction*. Philadelphia, PA: Multilingual Matters, 31–52.

Christensen, A. & Shenk, J. L. (1991). Communication, conflict, and psychological distance in non-distressed, clinic and divorcing couples. *Journal of Consulting and Clinical Psychology*, 59 (3): 458–63.

Christensen, A. & Sullaway, M. (1984). Communication patterns questionnaire. Unpublished manuscript. University of California, Department of Psychology, Los Angeles.

Chung, H. & Breslau, N. (2008). The latent structure of post-traumatic stress disorder: tests of invariance by gender and trauma type. *Psychological Medicine*, 38: 563–73.

Clark, H. W., Masson, C. L., Delucchi, K. L., Hall, S. M. & Sees, K. L. (2001). Violent traumatic events and drug abuse severity. *Journal of Substance Abuse Treatment*, 20(2): 121–7.

Clark, M. L. & Gioro, S. (1998). Nurses, indirect trauma and prevention. *Image: Journal of Nursing Scholarship*, 30: 85–7.

Coetzee, S. K. & Klopper, C. (2010). Compassion fatigue within nursing practice: a concept analysis. *Nursing & Health Sciences*, 12(2): 235–43.

Cohen, D. (1991). *Aftershock: The Psychological and Political Consequences of Disaster.* London: Paladin.

Cohen, E. L. (1952). The influence of varying degrees of psychological stress on problem-solving rigidity. *Journal of Abnormal and Social Psychology*, 47: 512–19.

Cohen, S. (1978). Environmental load and allocation of attention. In A. Baum & S. Valins (eds.), *Advances in Environmental Psychology*. Hillsdale, NJ: Laurence Erlbaum Associates.

Cohen, S., Mermelstein, R., Kamarck, T. & Hoberman, H. (1985). Measuring the functional components of social support. In I. G. Sarason & B. R. Sarason (eds.), *Social Support: Theory, Research, and Applications*. Dordrecht: Martinus Nijhoff, 73–94.

Cohen, S. & Wills, T. (1985). Stress, social support and the buffering hypothesis. *Psychological Bulletin*, 98: 130–57.

Cohen, M. S., Freeman, J. T., & Wolf, S. (1996). Metacognition in time stressed   decision making: recognizing, critiquing and correcting. Human Factors. 38, 206- 219..

Collins, S. & Long, A. (2003). Working with the psychological effects of trauma: consequences for mental health-care workers, a literature review. *Journal of Psychiatric and Mental Health Nursing*, 10: 417–24.

Cook, J. & Bickman, L. (1990). Social support and psychological symptomatology following a natural disaster. *Journal of Traumatic Stress*, 3: 541–56.

Cook, J. M., Riggs, D. S., Thompson, R., Coyne, J. C. & Sheikh, J. I. (2004). Posttraumatic stress disorder and current relationship functioning among World War II ex-prisoners of war. *Journal of Family Psychology*, 18 (1): 36–45.

Cooke, N. J., Salas, E., Cannon-Bowers, J. A., & Stout, R. (2000). Measuring team knowledge. Human Factors, 42, 151-173.

Cooke, N. J., Kiekel, P. A., & Helm E.(2001). Measuring team knowledge during skill acquisition of a complex task. International Journal of Cognitive Ergonomics:Special Section on Knowledge Acquisition, 5, 297-315.

Coomler, J. (2012). *Causes of Combat Stress in the Artillery Firing Battery Supporting High-Intensity Conflict in the European Theatre*. Ft. Leavenworth, KS: Army Command and General Staff College (Ad-A167674).

Cordova, M. J., Studts, J. L., Hann, D. E., Jacobsen, P. B. & Andrykowski, M. A. (2000). Symptom structure of PTSD following breast cancer. *Journal of Traumatic Stress*, 13: 301–19.

Cornille, T. A. & Meyers, T. W. (1999). Secondary traumatic stress among child protective service workers: prevalence, severity and predictive factors. *Traumatology*, 5: 1–16.

Cotton, P. & Hart, P. M. (2003). Occupational wellbeing and performance: a review of organisational health research. *Australian Psychologist*, 38: 118–27.

Council of Europe (2000). *International Organizations and Major Hazard Management*. Strasbourg: Council of Europe.

Courtois, C. A. (1988). *Healing the Incest Wound: Adult Survivors in Therapy*. New York: Norton.

Cramer, P. (2000). Defense mechanisms in psychology today: further processes for adaptation. *American Psychologist*, 55: 637–46.

Creamer, T. L. & Liddle, B. J (2005). Secondary traumatic stress among disaster mental health workers responding to the September 11 attacks. *Journal of Traumatic Stress*, 18 (1): 89–96.

Cunningham, M. (2003). Impact of trauma work on social work clinicians: empirical findings. *Social Work*, 48 (4): 451–9.

Cuny, F. (1993). *Disasters and Development*. New York and Oxford: Oxford University Press.

Cox, T and Makay , CJ (1981). A transactional approach to occupational stress. In N Corbett and P Richardson (eds). Stress, work design and porductivity. Wiley.

Daily Express (September 10 2010). A report by Mark Reynolds: Police have been sent on a training course to prepare for a massive earthquake (3 days training).

Dane, B. (2000). Child welfare workers: an innovative approach for interacting with secondary trauma. *Journal of Social Work Education, 36* (1): 27–39.

Danieli, Y. (1984). Psychotherapists' participation in the conspiracy of silence about the Holocaust. *Psychoanalytic Psychology*, 1 (1): 23–42.

Danieli, Y. (1988). Confronting the unimaginable: psychotherapists' reactions to victims of the Nazi Holocaust. In J. P. Wilson, Z. Harel & B. Kahana (eds.), *Human Adaptation to Extreme Stress: From the Holocaust to Vietnam*. New York: Plenum, 219–38.

Darwin, C. (1859). *On the Origin of Species by Means of Natural Selection, or, the Preservation of Favoured Races in the Struggle for Life*. London: John Murray.

Davidson, J. R. T. & Fairbank, J. A. (1993). The epidemiology of post-traumatic stress disorder. In J. R. T. Davidson & E. B. Foa (eds.), *Post-Traumatic Stress Disorder: DSM-IV and Beyond.* Washington, DC: American Psychiatric Press, 147–69.

Davis, C. (2001). The tormented and the transformed: understanding responses to loss and trauma. In R. Niemeyer (ed.), *Meaning Reconstruction & the Experience of Loss.* Washington, DC: American Psychological Association, 137–55.

Davis, J. A. (1996). Sadness, tragedy and mass disaster in Oklahoma City: providing critical incident stress debriefing to a community in crisis. *Accident and Emergency Nursing*, 4: 59–64.

Davis, M. H. (1980). A multidimensional approach to individual differences in empathy. *JSAS Cat. Selected Doc. Psychol.*, 10: 85.

Deighton, R. M., Gurris, N. & Traue, H. (2007). Factors affecting burnout and compassion fatigue in psychotherapists treating torture survivors: is the therapist's attitude to working through trauma relevant? *Journal of Traumatic Stress*, 20 (1): 63–75.

Dekel, R. & Solomon, Z. (2006). Marital relations among former prisoners of war: contributions of posttraumatic stress disorder, aggression, and sexual satisfaction. *Journal of Family Psychology*, 20 (4): 709–12.

Derogatis, L. R. (1994). Symptom Checklist-90-R: administration, scoring and procedure manual. Minneapolis, MN: National Computer Systems.

Derogatis, L. R. & Melisanatos, N. (1979). The DSFI: a multidimensional measure of sexual functioning. *Journal of Sex and Marital Therapy*, 5: 244–81.

DeSilva, P. (1999). Sexual consequences of non-sexual trauma. *Sexual and Marital Therapy*, 14 (2): 143–50.

Dhabhar, F. S. & McEwen, B. S. (1996). Stress-induced enhancement of antigen specific cell-mediated immunity. *Journal of Immunology*, 156: 2608–15.

Dhabhar, F. S. & McEwen, B. S. (1997). Acute stress enhances while chronic stress suppresses cell-mediated immunity in vivo: a potential role for leukocyte trafficking. *Brain, Behavior and Immunity*, 11: 286–306.

Dhabhar, F. S., Miller, A. H., McEwen, B. S. & Spencer, R. L. (1995). Effects of stress on immune cell distribution: dynamics and hormonal mechanisms. *Journal of Immunology*, 154: 5511–27.

Doherty. G. W. (1999). Cross-cultural counselling in disaster settings. http://www.massey.ac.nz/~trauma/issues/1999- 2/doherty.htm (accessed 14 November 2007).

Driskell, J. A. & Salas, E. (1991). Overcoming the effects of stress on military performance: human factors, training, selection strategies. In R. Gal & A. D. Mangelsdorff (eds.), *Handbook of Military Psychology*. New York: Wiley, 183–93.

Driskell, J. A., Willis, R. P. & Copper, C. (1992). Effect of over-learning on retention. *Journal of Applied Psychology*, 77 (5): 615–622.

Drabek, T E and Haas, JE (1969). Laboratory simulation of organisation stress. American Sociological Review. 34, 2, 223-238.

Driskell, JE ; Salas, E and Johnson, J (2001). Stress management and team training. In E Salas; C Bowers and E Edens (eds). Improving team work in organisation . Application of resource ,management training. Mahawah, NJ: Lawrence Erlbaum Associates.

Driskell, J E and Salas, E (1996). Stress and Human performance . Mahwah, NJ : Lawrence Erlbaum Associates.

Dunning, C., & Silva, M. (1980). Disaster induced trauma in rescue workers. Victimology:An International Journal,5(2-4), 287-297.

Driskell, JE and Johnson (1998). Sress exposure training. In JA Cannon-Bowers and E
    Salas (eds). Making decision under stress: implication of individual and team training.
    Washington DC: American Psychological Association.

Dynes, R R ; De Marchi , B and Pelnda, C (eds)(1987). Sociology of disasters: Contribution of
    sociology to disaster research. Franco Angels. Milano: Italy.

Dynes, RR (2003). Finding order in disorder: Continuities in 9-11 response. International
    Journal of Mass Emergencies and Disaster. 21, No3, 9-23.

Dynes and Drabek, T E (1994). The structure of disaster research: Its policy and
    disciplinary implications. International Journal of Emergencies and Disasters.   12, 5-23.

Dynes, RR and Tierney, K J (eds) (1994). Disaster ,collective behaviour and social

    organisation. Newark. Delaware. University of Delaware press

Dunkley, J. & Whelan, T. A. (2006). Vicarious traumatisation: current status and future

    directions. *British Journal of Guidance & Counselling*, 34 (1): 107–16.

Dutton, M. R. & Rubinstein, F. L. (1995). Working with people with PTSD: research implications.

    In C. R. Figley (ed.), *Compassion Fatigue: Coping with Secondary Traumatic Stress*

    Disorder in Those Who Treat the Traumatized. New York: Routledge, 82–100.

ECLAC & IDB (2000). *A Matter of Development: How to Reduce Vulnerability in the Face of*

    Natural Disasters. Mexico.

Edland , A. & Svenson, O. (1993). Judgement and decision making under time pressure: studies

    and findings. In O. Svenson & J. Maule (eds.), *Time Pressure and Stress in Human*

    Judgement and Decision Making. New York: Plenum, 27–40.

Edwards, D., Burnard, P., Coyle, D., Fothergill, A. & Hannigan, B. (2000). Stress and burnout in

    community mental health nursing: a review of the literature. *Journal of Psychiatric and*

    Mental Health Nursing, 7: 7–14.

Egbert, L. D., Batti, G. E., Welch, C. E. & Bartlett, M. K. (1964). Reproduction prospective pain by

    encouragement and instruction of patients. *New England Journal of Medicine*, 270: 825–7.

Ehlers,A.,&Clark,D.M.(2000).A cognitive model of post traumatic stress disorder. Behaviour Research and Therapy ,38, 319–345.

Elder, GH; Clipp, EC (1988). Combat experience , comradeship and psychological health. In J P Wilson ; Z Harold and B Kahana (eds). Human adaption to extreme stress: from the Holocaust to Vietnam. New York. Plenum Press . PP 131-156.

Elhai, J. D., Patrick, S. L. & Anderson, S. (2006). Gender and trauma related predictors of use of mental health treatment services among primary care patients. *Psychiatric Services*, 57 (10): 1505–9.

Ellis, T. & Dickey, T. (1998). Procedures surrounding the suicide of a trainee's patient: a national survey of psychology internships and psychiatry residency programs. *Professional Psychology: Research and Practice*, 29: 492–7.

Ellison, C. W. (1981). Spiritual well-being: conceptualization and measurement. *Journal of Psychology and Theology*, 11 (4): 330–40.

Enarson, E. & Morrow, B. (1997). A gendered perspective: the voices of women. In W. Peacock., B. Morrow & H. Gladwin (eds.), *Hurricane Andrew: Ethnicity, Gender, and the Sociology of Disasters*. London: Routledge.

Endler, N. S. & Parker, J. D. (1990). Multidimensional assessment of coping: a critical evaluation. *Journal of Personality and Social Psychology*, 58: 844–54.

Erdfelder, E., Faul, F. & Buchner, A. (1996). GPOWER: a general power analysis program. *Behavior Research Methods, Instruments, & Computers*, 28: 1–11.

ESCAP (1995). *Asia and the Pacific Report on Natural Hazards and Natural Disaster Reduction*. http://www.unescap.org/enrd/water_mineral/disaster/watdis1.htm (accessed 14 January 2008).

Etherington, K. (2000). Supervising counselors who work with survivors of childhood sexual abuse. *Counselling Psychology Quarterly*, 13 (4): 330–40.

Eysenck, H. (1983). Stress, disease, and personality: The 'inoculation effect'. In C. J. Cooper (ed.), *Stress Research*. New York: John Wiley & Sons, 121–46.

Farber, B. (1985). Clinical psychologist's perceptions of psychotherapeutic work. *Clinical Psychologist*, 38: 10–13.

Farberow, N. L. (2005). The mental health professional as suicide survivor. *Clinical Neuropsychiatry: Journal of Treatment Evaluation*, 2: 13–20.

Farran, C. J. & Kuhn, D. R. (1998). Finding meaning through caring for persons with Alzheimer's disease: assessment and intervention. In P. Wong & P. S. Fry (eds.), *The Human Quest for Meaning: A Handbook of Psychological Research and Clinical Applications*. Mahwah, NJ: Lawrence Erlbaum, 335–58.

FEMA resources for parents and children: After the Disaster: A Children's Mental Health Checklist. http://www.fema.gov/kids/tch_mntl.htm (accessed 28 January 2008).

Figley, C. R. (ed.) (1995a). *Compassion Fatigue: Coping with Secondary Traumatic Stress Disorder in Those who Treat the Traumatized*. New York: Routledge.

Figley, C. R. (1995b). Compassion fatigue as secondary traumatic stress disorder: an overview. In C. R. Figley (ed.), *Compassion Fatigue: Coping with Secondary Traumatic Stress Disorder in Those Who Treat the Traumatized*. New York: Routledge, 1–20.

Figley, C. R. (1995c). Epilogue: the transmission of trauma. In C. R. Figley (ed.), *Compassion Fatigue: Coping with Secondary Traumatic Stress Disorder*. New York: Routledge, 248–54.

Figley, C. R. (1999). Compassion fatigue: toward a new understanding of the cost of caring. In B. H. Stamm (ed.), *Secondary Traumatic Stress*. Towson, MD: Sidran Institute, 3–28.

Figley, C. R. (ed.) (2002a). *Treating Compassion Fatigue*. New York and London: Routledge.

Figley, C. R. (2002b). Compassion fatigue: psychotherapists' chronic lack of self care. *Journal of Clinical Psychology*, 58: 1433–41.

Figley, C. R. & Kleber, R. J. (1995). Beyond the 'victim': secondary traumatic stress. In R. Kleber, C. R. Figley & P. Gersons (eds.), *Beyond Trauma: Cultural and Societal Dynamics*. New York: Plenum, 75–98.

Figley, C. R. & Stamm, B. H. (1996). Compassion Satisfaction/Fatigue Self-Test for Helpers. http://www.isu.edu/~bhstamm/tests.htm.

Figley, C.R. (1998).Burnout as systemic traumatic stress: a model for helping traumatized family members. Figley, C.R. (Ed.), Burnout in families: the   systemic costs of caring, pp. 15-28. Boca Raton, FL: CRC Press.

Figley, C. R. (2002). Treating Compassion Fatigue. New York: Brunner-Routledge

Fischer, J. & Corcoran, K. (eds.) (1994). *Measures for Clinical Practice: A Sourcebook*. Vol. 2. New York: Free Press.

Fleishtnan, J. (1984). Personality characteristics and coping patterns. *Journal of Health and Social Behavior*, 25: 229–44.

Flin, R H (1996). Sitting in the hot seat: leaders and teams for critical incident management. Wiley.

Flin, R; Winter, J ; Sarar, C and Raduma, M (2009). Human factor in patient safety: Review of topics and tools. Geneva: WHO publications.

Foa, E B and Rothbaum, B O (1988) Treating the trauma of rape: Cognitive Behaviour therapy for PTSD. New York. Guildford Press.

Foa, E B ; Stekett, G and Rothbaum (1989). Behavioural /cognitive conceptualisation of post traumatic stress disorders. Behaviour Therapy. 20, 155-176.

Foa, E., Riggs, D., Dancu, C. & Rothbaum, B. (1993). Reliability and validity of a brief instrument for assessing posttraumatic stress disorder. *Journal of Traumatic Stress*, 6: 459–73.

Folkman, S. & Lazarus, R. S. (1980). An analysis of coping in a middle-aged community sample. *Journal of Health and Social Behavior*, 21: 219–39.

Folkman, R. S. & Lazarus, S. (1984). *Stress, Appraisal and Coping.* New York: Springer.

Folkman, S. & Moskowitz, J. T. (2004). Coping: pitfalls and promise. *Annual Review of Psychology*, 55: 745–74.

Follette, V. M., Polusny, M. M. & Milbeck, K. (1994). Mental health and law enforcement professionals: trauma history, psychological symptoms, and impact of providing services to child sexual abuse survivors. *Professional Psychology: Research and Practice*, 25 (3): 275–82.

Frankl, V. E. (1967). *Psychotherapy and Existentialism.* New York: Washington Square Press.

Frankl, V. E. (1969). *The Will to Meaning.* New York: Plume Books.

Frankl, V. E. (1984 [1946]). *Man's Search for Meaning*, rev. & updated. New York: Washington Square Press.

Freedy, J. R., Kilpatrick, D. G. & Resnick, H. S. (1993). Natural disasters and mental health: theory, assessment, and intervention. *Journal of Social Behavior and Personality* [Special issue: *Handbook of Post-disaster Interventions*], 8: 49–103.

Friedman, M and Roseman, R (1997). Type A behaviour and your heart. New York. Knopf.

Gailard, A W (2008). Concentration , stress and performance. In PA Hancock, and J L Szalma. Performance Under Stress. Ashgate.

Gaillard, A. W. K. (2001). Stress, workload, and fatigue as three behavioural states: a general overview. In P. A. Hancock and P. A. Desmond (eds.), *Stress, Workload, and Fatigue.* Mahwah, NJ: Erlbaum, 623–39.

Gaillard, A. W. K. (2008). Concentration, stress and performance: In A. P. Hancock and J. L. Szalma (eds.), *Performance under Stress*. Burlington, VT: Ashgate Publishing.

Gallavan, D. B. & Newman, J. L. (2013). Predictors of burnout among correctional mental health professionals. *Psychological Services*, 10 (1): 115–22.

Gavrilovic, J. J., Schutzwohl, M. & Fazel, M. (2005). Who seeks treatment after a traumatic event and who does not? A review of findings on mental health service utilization. *Journal of Traumatic Stress*, 18 (6): 595–605.

Gentry, J. E., Baranowsky, A. B. & Dunning, K. (2002). ARP: the accelerated recovery program (ARP) for compassion fatigue. In C. R. Figley (ed.), *Treating Compassion Fatigue.* New York and London: Routledge, 123–37.

Ghahramanlou, M. & Brodbeck, C. (2000). Predictors of secondary trauma in sexual assault trauma counselors. *International Journal of Emergency Mental Health*, 2 (4): 229–40.

Gibbs, M. (1989). Factors in the victim that mediate between disaster and psychopathology. *Journal of Traumatic Stress*, 2: 489–514.

Gick, M. L. & Holyoak, K. J. (1987). The cognitive basis of knowledge transfer. In S. M. Cormier & J. D. Hagman (eds.), *Transfer of Training: Contemporary Research and Applications*. New York: Academic Press, 9–46.

Giesbrecht, H. A. (1997). Meaning as a predictor of work stress and job satisfaction. Unpublished Master's thesis, Trinity Western University, Langley, BC.

Gilbert, R. & Kreimer, A. (1999). *Learning from the World Bank's Experience of Natural Disaster Related Assistance*. World Bank, Disaster Management Facility, Washington DC: World Bank.

Gist, R. & Lubin, B. (1989). Introduction: ecological and community perspectives on disaster intervention. In R. Gist & B. Lubin (eds.), *Psychosocial Aspects of Disaster.* New York: John Wiley & Sons.

Gist, R. & Woodall, J. (1999). There are no simple solutions to complex problems: The rise and fall of critical incident stress debriefing as a response to occupational stress in the fire service. In R. Gist & B. Lubin (eds.), *Response to Disaster: Psychosocial, Community, and Ecological Approaches.* Ann Arbor, MI: Braun-Brumfield.

Gold, S. N. (2008). The relevance of trauma to general clinical practice. *Psychological Trauma: Theory, Practice and Policy,* S (1): 114–24.

Goldberg, D (1967). The assessment of the severity of non-psychiatric illness by means of questionnaire. Unpublished doctoral thesis. university of London.

Goldberg, D (1972). The detection of psychaitric illness by questionnaire. Moudsley Monograph , No 21..

Goldberg, D (1978). Manual of General Health Questionnaire. Windsor , UK: Nefer-   Nelson Publication.

Goldberg, D.P., & Hillier, V. F. (1979). A Scaled version of the General Health Questionnaire. Psychological Medicine, 9, 139-145

Goldberg, D. & Huxley, P. (1992). *Common* Mental Disorders: A Bio-Social Model. New York and London: Routledge.

Golding, J. M., Stein, J. A., Siegel, J. M., Burnam, A. & Sorenson, S. B. (1988). Sexual assault history and use of health and mental health services. *American Journal of Community Psychology,* 16 (5): 625–44.

Good, D. A. (1996). Secondary traumatic stress in art therapists and related mental health professionals. *Dissertation Abstracts International, 57* (06): 2370A.

Grad, O. T., Zavasnik, A. & Groleger, U. (1997). Suicide of a patient: gender differences in bereavement reactions of therapists. *Suicide & Life-Threatening Behavior,* 21: 379–86.

Green, BL (1991) Evaluating the effects of disasters. Psychological Assessment. 3, 538-546.

Green, R and Lindy, J (1994). Post-traumatic stress disorder in victims of disasters. Psychiatric Clinic of North America. 17, 301-309.

Gribble, S., Halvey, A., Ives, Z., Rodrig, M. & Suiciu, D. (2001). What can databases do for peer-to-peer? Proc. WebDB (Databases on the Web), June.

Grice, J. W. (2001). Computing and evaluating factor scores. *Psychological Methods*, 6: 430–50.

GTZ (2000). German Technical Cooperation in Disaster Prevention and Mitigation. Eschborn.

Hagman, G (1984). Prevention better than cure. Report on human and environmental disasters in the third world, prepared for the Swedish Red Cross. Stockholm.

Hahlweg, K., Kaiser, A., Christensen, A., Fehm-Wofsdorf, G. & Groth, T. (2000). Self-report and observational assessment of couples' conflict: the concordance between the Communication Pattern Questionnaire and the KPI observation system. *Journal of Marriage and the Family*, 62: 61–7.

Haley, S. A. (1974). When the patient reports atrocities: specific treatment considerations of the Vietnam veteran. *Archives of General Psychiatry*, 30: 191–6.

Haley, W. E., Gitlin, L. N., Wisniewski, S. R., Mahoney, D. F., Coon, D. W., Winter, L., Corcoran, M., Schinfeld, S. & Ory, M. (2004). Well-being, appraisal, and coping in African American and Caucasian dementia caregivers: findings from the REACH study. *Aging & Mental Health*, 8: 316–29.

Hall, K. (2007). Sexual dysfunction and childhood sexual abuse: gender differences and treatment implications. In S. R. Leiblum (ed.), *Principals and Practice of Sex Therapy*. New York: Guildford Press, 350–78.

Hamilton, V. (1982). Cognition and stress: an information processing model. In L. Goldberger & S. Breznitz (eds.), *Handbook of Stress: Theoretical and Clinical Aspects*. New York: Free Press 105–120.

Hancock, P. A. & Szalma, J. L. (2007). Stress and Neuroergonomics. In R. Parasuraman and M. Rizzo (eds.), *Neuroergonomics: The Brain at Work*. Oxford: Oxford University Press, 195–206.

Hancock, P. A. & Szalma, J. L. (eds.) (2008). *Performance under Stress*. Burlington, VT: Ashgate Publishing Company.

Hancock, P. A. & Weaver, J. L. (2005). On time distortion under stress. *Theoretical Issues in Ergonomics Science*, 6: 193–211.

Hancock, PA and Szalma, JL (2008) . Performance Under Stress. Ashgate.

Herbison R J.Rando, TA.Plant,TG.,& Mitchell, G (1984)National EMS Burnout   Survey . Journal of Emergency Medical Services,9, 48-50.

Harbert, K. & Hunsinger, M. (1991). The impact of traumatic stress reactions on caregivers. *Journal of the American Academy of Physician Assistants*, 4: 384–94.

Hartsough, DM ; Garaventa-Meyers (Eds.) (1985) , Disaster Work and Mental Health Prevention and Control of Stress Among Workers, Center for Mental Health Studies of Emergencies, US Departmentof Health and Human Services, Washington, DC.

Harvey, M. (1996). An ecological view of psychological trauma and trauma recovery. *Journal of Traumatic Stress*, 9: 3–23.

Heather, J. (2002). Defeating compassion fatigue. *Chronicle of Philanthropy*, 14 (12): 37–40.

Hendrick, S. S. (1988). A generic measure of relationship satisfaction. *Journal of Marriage and the Family*, 50: 93–8.

Hendrick, S. S., Dicke, A. & Hendrick, C. (1998). The relationship assessment scale. *Journal of Social and Personal Relationships*, 15 (1): 137–42.

Herman, J. L. (1992). *Trauma and Recovery*. New York: HarperCollins.

Hodgson, M. E. & Palm, R. (1992). Attitude toward Disaster: a GIS design for analyzing human response to earthquake hazards. *Geo Info Systems*, July–August: 41–51.

Hodes, M and Diaz-Caneja, A (2007) Treatment options for young people and refugees with post-traumatic stress disorder. In Hosin, A . Responses to Traumatized Children. Palgrave Macmillan.

Hollingshead , AB McGrath , JE (1995). Computer-assisted groups: A critical review of the empirical research. In RL Guzzo & E. Salas (Eds.), Team effectiveness and decision-making in organizations(pp. 46-78). San Francisco: jossey-bass

Horowitz, MJ (1986). Stress-response syndromes: A review of post-traumatic and adjustment disorders. Hospital and Community Psychiatry. 37, 3, 241-9.

Horowitz, M. J., Wilner, N. & Alvarez, W. (1979). Impact of event scale: A measure of subjective stress. *Psychometric Medicine*, 41 (3): 209–18.

Horowitz, M. D, Wilner, N. & Alvarez, W. (1980). Signs and symptoms of post traumatic stress disorder. *Archives of General Psychiatry*, 37: 85–92.

Hosin, Amer(ed) (2007). Responses to Traumatised Children. Palgrave.

Hosin, Amer (ed) (2000). Essays on Issues in Applied Developmental Psychology and Child Psychiatry. New York: Edwin Mellen Press.

Hosin, Amer & Al-Heeti, Khalaf Nassar (1989). Psychological wellbeing of University students using the GHQ. Journal of Social Science, published by University of Kuwait. PP 141-152, Spring issue.

Hoyle, R. H. & Panter, A. T. (1995). Writing about structural equation models. In R. H. Hoyle (ed.), *Structural Equation Modeling: Concepts, Issues, and Applications* Thousand Oaks, CA: Sage, 158–76.

Hutton, R ; Miller, J and Thordsen, T (2008) . Decision centre design: Leveraging cognitive task analysis in design. In Erik Hollagal. Handbook of Cognitive Task Design. Taylor & Francis.

Hyer, L., Stanger, E. & Boudewyns, P. (1999). The interaction of post-traumatic stress disorder and depression among older combat veterans. *Journal of Clinical Psychology*, 55: 1073–83.

Illgen, DR and John, AP (2001). Motivations in teams. In M. Erez; V.Kleinbeck and H Thierry (eds). Work motivation in the context of globalizing economy. New York: Erbaum.

Ilgen, DR ; Holleubeck, JR; Johnson, M and Jundit,D (2005). Teams in organisations. From input-process to-output models. Annual Review of Psychology. 56, 517-543.

Iliffe, G. (2000). Exploring the counselor's experience of working with perpetrators and survivors of domestic violence. *Journal of Interpersonal Violence*, 15 (4): 393–413.

Ingleton, J. (ed.) (2000). *Natural Disaster Management*. London: Tudor Rose Holdings.

International Strategy for Disaster Reduction (ISDR) (2002). *Living with Risk: A Global Review of Disaster Reduction Initiatives.* Prepared as an interagency effort coordinated by the ISDR Secretariat with special support from the Government of Japan, the World Meteorological Organization and the Asian 10-24 EGGSSA . Chapter 10: Humanitarian Response.

IPCC (2002). *Assessment Report of the IPCC*. Cambridge: Cambridge University Press.

Jackson, J. L., Calhoun, K. S., Amick, A. E., Maddever, H. M. & Habif, V. L. (1990). Young adult women who report childhood intrafamilial sexual abuse: subsequent adjustment. *Archives of Sexual Behavior*, 19: 211–21.

Jacobson, J. M., Ting, L., Sanders, S. & Harrington, D. (2004). Prevalence of and reactions to fatal and nonfatal suicidal behavior: a national study of mental health social workers. *Omega: Journal of Death and Dying*, 49: 237–48.

Janoff-Bulman, R. (1992).*Shattered Assumptions: Towards a New Psychology of Trauma*. New York: Free Press.

Jenkins, S. R. & Baird, S. (2002). Secondary traumatic stress and vicarious trauma: a validation study. *Journal of Traumatic Stress,* 15: 423–32.

Johansen, K. H. (1993). Countertransference and divorce of the therapist. In G. H. Gold & J. C. Nemiah (eds.), *Beyond Transference: When the Therapist's Real Life Intrudes.* Washington, DC: American Psychiatric Press, 87–108.

Jones, F and Fletcher, B. (1998) Job control and health. In M J Schabracq; JA Winnubst and CL Cooper (Eds) Handbook of Work and Health Psychology. Chichester: Wiley.

Johnston JH, Cannon-Bowers JA.(1996). Training for stress exposure. In Stress and Human Performance, ed. JE Driskell, E Salas, pp.223–56. Mahweh, NJ: Erlbaum.

Joinson, C. (1992). Coping with compassion fatigue. *Nursing*, 22: 116–22.

Johnson, H. and Thompson, AR (2008). The development and maintenance of post traumatic Stress Disorder (PTSD) in civilian adult survivors of war trauma and torture: a review. Clinical Psychology Review, 28: 36–4.

Jöreskog, K. G. (1993). Testing structural equation models. In K. A. Bollen & J. S. Long (eds.), *Testing Structural Equation Models*. Newbury Park, CA: Sage, 294–316.

Jorna, P. G. A. M. (1985). Heart-rate parameters and the coping process under water. In J. F. Orhebeke, G. Mulder and L. J. P. Van Doornen (eds.), *Psychology of Cardiovascular Control*. Proceedings of NATO conference on Cardio–Vascular Psychophysiology: Theory and Methods, 12–17 June 1983. The Netherlands. New York: Plenum, 827–839.

Joseph, S. (2000). Psychometric evaluation of Horowitz's impact of event scale: a review. *Journal of Traumatic Stress*, 13(1): 101–13.

Kadambi, M. (2004). Counselling and the professional: vicarious trauma, burnout and rewards from clinical practice. Dissert Abstr. Int. B Sci. Eng. 65(1B): 441.

Kadambi, M. A. & Truscott, D. (2003). An investigation of vicarious traumatisation among therapists working with sex offenders. *Traumatology*, 9 (4): 216–30.

Kadambi, M. A. & Truscott, D. (2004). Vicarious trauma among therapists working with sexual violence, cancer, and general practice. *Canadian Journal of Counselling*, 38(4): 260–76.

Kahill, S. (1988). Interventions for burnout in the helping professional: A review of the empirical evidence. *Canadian Journal of Counseling Review*, 22 (3): 162–9.

Kanki, B and Palmer, MT (1993). Communication in CRM. In LE Wiener, B Kanki and RL Helmreich (eds). Cockpit resource management. San Diego: Academic Press . PP 283-310.

Kapur, R. (1999). Unconscious communications. In A. Long (ed.), *Interaction for Practice in Community Nursing*. Basingstoke: Macmillan, 217–28.

Karasek, R. & Theorell, T. (1990). *Healthy Work*. New York: Basic Books.

Kassam-Adams, N. (1995). The risks of treating sexual trauma: stress and secondary trauma among psychotherapists. In B. H. Stamm (ed.), *Secondary Traumatic Stress: Self-Care Issues for Clinicians, Researchers and Educators*. Lutherville, MD: Sidran Press, 37–50.

Keane TM, *Marshall* AD, *Taft* CT. Posttraumatic stress disorder: etiology, epidemiology, and treatment outcome. Annu Rev Clin Psychol. *2006*; 2:161-   97.

Klein, G (1996), "The effect of acute stressors on decision making", in Driskell, J., Salas, E (Eds),Stress and Human Performance, Lawrence Erlbaum, Hillsdale,   NJ

Koenen KC. Genetics of posttraumatic stress disorder: review and recommendations for future studies. Journal of Traumatic Stress. 2007;20:737–750.

Keinan, G. (1988). Training for dangerous task performance: the effects of expectations feedback. *Journal of Applied Social Psychology*, 18 (4): 355–73.

Keinan, G. & Friedland, N. (1996). Training effective performance under stress: queries, dilemmas, and possible solutions. In E. J. Driskell & E. Salas (eds.), *Stress and Human Performance*. Mahwah, NJ: Erlbaum, 257–77.

Kenardy, J. & Carr, V. (2000). Debriefing post disaster follow-up after a major disaster. In B. Raphael & J. Wilson (eds.), *Psychological Debriefing: Theory, Practice and Evidence*. Cambridge: Cambridge University Press.

Kessler, R. C., Sonnega, A., Bromet, E., Hughes, M. & Nelson, C. (1995). Post-traumatic stress disorder in the National Comorbidity Survey. *Archives of General Psychiatry*, 52: 1048–60.

King, D. W., Leskin, G. A., King, L. A. & Weathers, F. W. (1998). Confirmatory factor analysis of the clinician-administered PTSD scale: evidence for the dimensionality of post-traumatic stress disorder. *Psychological Assessment*, 10: 90–6.

King, L., King, D., Fairbank, J. & Adams, G. (1998). Resilience – recovery factors in post-traumatic stress disorder among female and male veterans: hardiness, post war social support and additional stressful life events. *Journal of Personality and Social Psychology*, 74: 420–34.

Kleespies, P. M. (1993). The stress of patient suicidal behavior: implications for interns and training programs in psychology. *Professional Psychology: Research and Practice*, 24: 477–82.

Kleespies, P. M., Penk, W. E. & Forsyth, J. P. (1993).The stress of patient suicidal behavior during clinical training: incidence, impact, and recovery. *Professional Psychology: Research and Practice*, 24: 293–303.

Kline, R. B. (1998). *Principles and Practice of Structural Equation Modeling*. New York: Guilford Press.

Knight, C. (1997). Therapists' affective reactions to working with adult survivors of child sexual abuse: an exploratory study. *Journal of Child Sexual Abuse*, 6 (2): 17–41.

Koenig, H. G., George, L. K. & Siegler, I. C. (1988). The use of religion and other emotion-regulating coping strategies among older adults. *Gerontologist*, 28: 303–10.

Kreimer, A. & Arnold, M. (2000). *Managing Disaster Risk in Emerging Economies*. Disaster Risk Management Series No. 2. Washington, DC: World Bank.

Kreimer, A. & Munasinghe, M. (eds.) (1991). *Managing Natural Disasters and the Environment*. Washington, DC: World Bank.

Kron, W. & Plate, E. J. (1996). Natural Disaster and Disaster Reduction. Deutsche – IDNDR-Reihe No.1.

Kruger, L., Bernstein, G. & Botman, H. (1994). The relationship between team friendships and burnout among residential counselors. *Journal of Social Psychology*, 135: 191–201.

Kruger, L., Botman, H. & Goodenow, C. (1991). An investigation of social support and burnout among residential counselors. *Child Youth Care Forum*, 20: 335–52.

Kavanagh, Jennifer (2005) Stress and Performance: A Review of the Literature and Its Applicability to the Military,Santa Monica, Calif.: RAND Corporation, TR-192-RC, 2005.

Lang, J. M. (1994). Does religiosity provide a buffer against uncontrollable life stress? Unpublished honour's thesis, Trent University, Peterborough, Canada.

Langer, E. J., Janis, L. & Wolfer, J. (1975). Reduction of psychological stress in surgical patients. *Journal of Experimental Social Psychology*, 11: 155–65.

Larsen, D., Stamm, B. H. & Davis, K. (2002). Telehealth for prevention and interventions of the negative effects of caregiving. *Traumatic Stress Points: Newsletter for the International Society for Traumatic Stress Studies*, 16(4).

Larsson, G. (1987). Routinization of mental training in organisations: effects on performance and well-being. *Journal of Applied Psychology*, 72: 88–96.

Lazarus, R. S. (1966). *Psychological Stress and the Coping Process*. New York: McGraw-Hill.

Lazarus, R. S. & Folkman, S. (1984). *Stress, Appraisal and Coping*. New York: Springer.

Lee, C. S. (1995). Secondary traumatic stress in therapists who are exposed to client traumatic material. *Dissertation Abstracts International*, 56(08): 4586B.

Lee, F. K., Sheldon, K. M. & Turban, D. B. (2003). Personality and the goal-string process: the influence of achievement, goal patterns, goal level, and mental focus on performance and enjoyment. *Journal of Applied Psychology*, 88: 256–65.

Lerias, D. & Byrne, M. (2003). Vicarious traumatisation. *Stress Health*, 19: 129–38.

Leventhal, H., Brown, D., Shachman, S. & Engquist, G. (1979). Effects of preparatory information about sensations, threat of pain, and attention or cold pressure distress. *Journal of Personality and Social Psychology*, 37: 688–714.

Linley, P. A. & Joseph, S. (2007). Therapy work and therapists' positive and negative well-being. *Journal of Social and Clinical Psychology*, 26 (3): 385–403.

Logan, G. D. (1985). Skill and automaticity. Canadian Journal of Psychology, 9: 283–6.

Lovibond, P. & Lovibond, S. (1996). *Manual for the Depression, Anxiety, Stress Scales*, 2nd edn. Sydney: Psychology Foundation.

Lubin, B and Gist , R (1999) Response to Disaster : Psychological, Community, and Ecological Approaches. Routledge.

Lubit, R (2007).Responding to traumatized children. An overview of diagnosis and treatment. In Hosin, A . Responses to Traumatized Children. Palgrave   Macmillan.

Lugris V. (2001). Vicarious traumatisation in therapists: contributing factors, PTSD symptomatology and cognitive distortions. *Dissert Abstr Int B Sci Eng*, 61(10B): 5571.

Lukas, E. (1986). *Meaning in Suffering: Comfort in Crisis through Logotherapy.* Berkeley, CA: Institute of Logotherapy Press.

Lyon, E. (1999). Hospital staff reactions to accounts by survivors of childhood abuse. *American Journal of Orthopsychiatry*, 63 (3): 410–16.

Lyons, M. (2001). Living with post-traumatic stress disorder: the wives'/female partners' perspective. *Journal of Advanced Nursing*, 34 (1): 69–78.

Mahoney, J., Drinka, T. J. K., Abler, R., Gunter-Hunt, G., Matthews, C., Gravenstein, S. et al. (1994). Screening for depression: single question versus GDS. *Journal of the American Geriatrics Society*, 42: 1006–8.

Mainous, A. G., Smith, D. W., Acierno, R. & Geesey, M. E. (2005). Differences in posttraumatic stress disorder symptoms between elderly non-Hispanic whites and African Americans. *Journal of the National Medical Association*, 91: 546–9.

Maltz, W. (1991). Caution: treating sexual abuse can be hazardous to your love life. *Treating Abuse Today*, 2 (2): 20–4.

Marmaras, E., Lee, S. S., Siegel, H. & Reich, W. (2003). The relationship between attachment styles and vicarious traumatization in female trauma therapists. *Journal of Prevention & Intervention in the Community*, 26 (1): 81–92.

Maslach, C. (1982). *Burnout: The Cost of Caring.* Upper Saddle River, NJ: Prentice Hall.

Maslach, C. (2001). *The Truth About Burnout.* San Francisco: Jossey Bass.

Maslach, C. & Goldberg, J. (1998). Prevention of burnout: new perspectives. *Applied and Preventive Psychology*, 7: 63–74.

Maslach, C., Jackson, S. & Leiter, M. P. (1996). *Maslach Burnout Inventory Manual*, 3rd edn. Palo Alto, CA: Consulting Psychologists Press.

Maslach, C., Schaufeli, W. B. & Leiter, M. P. (2001). Job burnout. *Annual Review of Psychology*, 52: 379–422.

May, R. (1979). *Psychology and the Human Dilemma*. New York: W. W. Norton.

May, R. (1983). *The Discovery of Being*. New York: W. W. Norton.

Maynard, S. J. (1982). *Evolution and the Theory of Games*. Cambridge: Cambridge University Press.

Mazer, N. A., Leiblum, S. R. & Rosen, R. C. (2000). The Brief Index of Sexual Functioning for Women (BISF-W): a new scoring algorithm and comparison of normative and surgically menopausal populations. *Menopause: Journal of the North American Menopause Society*, 7 (5): 350–63.

Mazza, J. J. & Reynolds, W. M. (1999). Exposure to violence in young inner-city adolescents: relationships with suicidal ideation, depression, and PTSD symptomatology. *Journal of Abnormal Child Psychology*, 27: 203–13.

Meadors, P., Lamson, A., Swanso, M., White, M., & Sira, N. (2009). Secondary traumatization in pediatric healthcare providers: Compassion fatigue, burnout, and secondary traumatic stress. Omega: Journal of Death & Dying, 60(2), 103-128.

McCann, I. L. & Pearlman, L. A. (1990a). *Psychological Trauma and the Adult Survivor: Theory, Therapy, and Transformation*. New York: Routledge.

McCann, I. L. & Pearlman, L. A. (1990b). Vicarious traumatisation: a framework for understanding the psychological effects of working with victims. *Journal of Traumatic Stress*, 3: 131–49.

McCann, I. L. & Pearlman, L. A. (1991). Vicarious traumatization: the emotional costs of working with survivors. *Treating Abuse Today*, 3 (5): 28–31.

McCann, I. L. & Pearlman, L. A. (1992). Constructivist self development theory: a theoretical model of psychological adaptation to severe trauma. In D. K. Sakheim & S. E. Devine (eds.), *Out of Darkness: Exploring Satanism and Ritual Abuse*. New York: Lexington Books, 185–206.

McCann, I. L., Sakheim, D. K. & Abrahamson, D. J. (1988). Trauma and victimization: A model of psychological adaptation. *The Counseling Psychologist*, 16 (4): 531–94.

McCaughey, B. G. (1991). Observations about battle fatigue: its occurrence and absence. *Military Medicine*, 156: 694–5.

McCrae, R. R. & Costa, P. T. (1986). Personality, coping, and coping effectiveness in an adult sample. *Journal of Personality*, 54: 384–405.

McDowell, I. & Newell, C. (1996). *Measuring Health*, 2nd edn. New York: Oxford University Press.

McEwen, B. S. (2003). Mood disorders and allostatic load. *Biological Psychiatry*, 54: 200–7.

McEwen, B. S. & Wingfield, J. C. (2003). The concept of allostasis in biology and biomedicine. *Hormones and Behavior*, 43: 2–15.

McEwen, B. S. & Sapolsky, R. M. (1995). Stress and cognitive function. *Current Opinion in Neurobiology*, 5: 205–16.

McFarlane, A. C., Bookless, C. & Air, T. (2001). Posttrauamtic stress disorder in a general psychiatric inpatient population. *Journal of Traumatic Stress*, 14: 633–45.

McLean, S., Wade, T. & Encel, J. (2003). The contribution of therapist beliefs to psychological distress in therapists: an investigation of vicarious traumatisation, burnout and symptoms of avoidance and intrusion. *Behavioural and Cognitive Psychotherapy*, 31: 417–28.

McRae, R. R. (1984). Situational determinants of coping responses: loss, threat and challenge. *Journal of Personality and Social Psychology*, 49: 919–28.

Meadors, P., Lamson, A., Swanso, M., White, M. & Sira, N. (2009). Secondary traumatization in pediatric healthcare providers: compassion fatigue, burnout, and secondary traumatic stress. *Omega: Journal of Death & Dying*, 60 (2): 103–28.

Meichenbaum, D. (1985). *Stress Inoculation Training*. New York: Pergamon.

Midkiff, S. F. & Bostian, C. W. (2001). Rapidly deployable broadband wireless communications for emergency management. National Digital Government Research Conference (dg. o 2001), 21–23 May, Redondo Beach, CA, USA.

Mikulincer, M. & Florian, V. (1996). Coping and adaptation to trauma and loss. In M. Zeidner & M. S. Endler (eds.), *Handbook of Coping: Theory, Research, Applications*. New York: John Wiley & Sons, 554–72.

Miller, R. S. & Lefcourt, H. M. (1982). The assessment of social intimacy. *Journal of Personality Assessment*, 46 (5): 514–18.

Miller, S. M. & Morgan, C. E. (1983). Interacting effects of information and coping style in adapting to gynecologic stress: should the doctor tell all? *Journal of Personality and Social Psychology*, 45: 223–36.

Mills, B. & Turnbull, G. (2004). Broken hearts and mending bodies: the impact of trauma on intimacy. *Sexual and Relationship Therapy*, 19 (3): 265–89.

Mitchell, J. T. (1983). When disaster strikes: the critical incident stress debriefing process. *Journal of Emergency Medical Services*, 8: 36–9.

Mitchell, J. T. & Everly, G. S. (1996). *Critical Incident Stress Debriefing: An Operations Manual for the Prevention of Traumatic Stress Among Emergency Service and Disaster Personnel*, 2nd edn. revised. Baltimore, MD: Chevron Publishing.

Mitroff, I. (2001). *Managing Crises Before They Happen: What Every Executive and Manager Needs to Know about Crisis Management*. New York: American Management Association.

Mobile Broadband for Emergency and Safety Applications: MESA Project. http://www.projectmesa.org/

Morgan, BB; Gilckman, AS; Woodward, EA; Blaiwes, AS and Salas, E (1986). Measurement of team behaviour in a navy environment (Tech Rep No NTSCTR-86-014), Orlando, FL. Naval Training Systems Centre.

Morgan, B and Brown, C (1995). Teamwork stress: Implications for team decision making. In R Guzzo and E Salas(eds). Team effectiveness and decision making in organisation. San Francisco, CA: Jossey Bass.

Motta, R. W., Chirichella, D. M., Maus, D. M. & Lombardo, M. T. (2004a). Assessing secondary trauma. *Behavior Therapist*, 27 (3): 54–7.

Motta, R. W., Hafeez S., Sciancalepore, R. & Diaz, A. B. (2001). Discriminant validation of the modified secondary trauma questionnaire. *Journal of Psychotherapy in Independent Practice*, 2 (4): 17–25.

Motta, R. W., Keefer, J. M., Hertz, M. D. & Hafeez, S. (1999). Initial evaluation of the secondary trauma questionnaire. *Psychological Reports*, 85: 997–1002.

Motta, R. W., Newman, C. L., Lombardo, K. L. & Silverman, M. A. (2004b). Objective assessment of secondary trauma. *International Journal of Emergency Mental Health*, 6 (2): 67–74.

Moulden, H. M. & Firestone, P. (2007). Vicarious traumatization: the impact on therapists who work with sexual offenders. *Trauma, Violence, & Abuse*, 8 (1): 67–83.

Mueller, R. O. (1996). *Basic Principles of Structural Equation Modeling: An Introduction to LISREL and EQS*. New York: Springer.

Munroe, J. F. (1990). Therapist traumatization from exposure to clients with combat related post-traumatic stress disorder: implications for administration and supervision. *Dissertation Abstracts International*, 52 (03): 1731B.

Munroe, J. F., Shay, J., Fisher, L., Makary, C., Rapperport, K. & Zimering, R. (1995). Preventing compassion fatigue: a team treatment model. In C. R. Figley (ed.), *Compassion Fatigue: Coping with Secondary Traumatic Stress Disorder in Those Who Treat the Traumatized*. New York: Routledge, 209–31.

Naylor, J. C., & Briggs, G. E. (1965). Team-training effectiveness under various conditions. Journal of Applied Psychology, 49, 223-229.

Neimeyer, R. (1999). Narrative strategies in grief therapy. *Journal of Constructivist Psychology*, 12: 65–85.

Neimeyer, R. (2000). Searching for the meaning of meaning: grief therapy and the process of reconstruction. *Death Studies*, 24 (6): 541–58.

Neimeyer, R. & Keesee, N. (1998). Dimensions of diversity in the reconstruction of meaning. In J. D. Kenneth & J. D. Joyce (eds.), *Living Grief: Who We Are, How We Grieve*. Philadelphia, PA: Hospice Foundation of America, 223–37.

Nelson, B. S. & Wright, D. W. (1996). Understanding and treating post-traumatic stress disorder symptoms in female partners of veterans with PTSD. *Journal of Marital and Family Therapy*, 22 (4): 455–67.

Nelson-Gardell, D. & Harris, D. (2003). Childhood abuse history, secondary traumatic stress, and child welfare workers. *Child Welfare*, 82: 5–26.

Neumann, D. A. & Gamble, S. (1994). Issues in the professional development of psychotherapists: Countertransference and vicarious traumatization in the new trauma therapist. *Psychotherapy*, 32(2): 341–47.

Noller, P. & White, A. (1990). The validity of the Communication Patterns Questionnaire. *Psychological Assessment: A Journal of Consulting and Clinical Psychology*, 2 (4): 478–82.

Norcross, John. C. (2000) Psychotherapist Self-Care: Practitioner-Tested, Research-   Informed Strategies. Professional Psychology: Research and Practice. Vol. 31 (6) December 2000, pp. 710-713.

Norlev, J., Davidsen, M., Sundaram, V. & Kjøller, M. (2005). Indicators associated with suicidal ideation and suicide attempts among 16–35-year-old Danes: a national representative population study. *Suicide and Life-Threatening Behavior*, 35: 291–308.

Ohaeri, J. U. (2003). The burden of caregiving in families with a mental illness: a review of 2002. *Current Opinion in Psychiatry*, 16: 457–65.

O'Halloran, T. M. & Linton, J. M. (2000). Stress on the job: self-care resources for counselors. *Journal of Mental Health Counseling*, 22 (4): 354–64.

O'Keefe, P., Westgage, K. & Wisner, B. (1976). Taking the naturalness out of natural disasters. *Nature*, 260 (5552): 566–7.

Oliver-Smith, A (1996). Anthropological research on hazards and disasters. Annal Review of Anthropology. 25,303-328.

Olff, M., Langeland, W., Draijer, N. & Gersons, B. P R. (2007). Gender differences in posttraumatic stress disorder. *Psychological Bulletin*, 113 (2): 183–204.

Organisation for Economic Co-operation and Development (OECD) (1994). Development Assistance Committee: Guidelines for Aid Agencies on Disaster Mitigation, No. 7. Paris: OECD.

Orlando, J. A. & Koss, M. P. (1983). The effect of sexual victimization in sexual satisfaction: a study of the negative-association hypothesis. *Journal of Abnormal Psychology*, 92: 104–6.

Orsillo, S. M., Weathers, F. W., Litz, B. T., Steinberg, H. R., Huska, J. A. & Keane, T. M. (1996). Current and lifetime psychiatric disorders among veterans with war zone-related posttraumatic stress disorder. *Journal of Nervous and Mental Disease*, 184: 307–13.

Ortlepp, K. & Friedman, M. (2002). Prevalence and correlates of secondary traumatic stress in workplace lay trauma counselors. *Journal of Traumatic Stress*, 15 (3): 213–22.

Ozer, E. J., Best, S. R., Lipsey, T. L. & Weiss, D. S. (2003). Predictors of posttraumatic stress disorder and symptoms in adults: A meta-analysis. *Psychological Bulletin*, 129 (1): 52–73.

Pasch, Richard (2012). Tropical Storm Sandy Discussion Number 2 (Report), 22 October. National Hurricane Center. http://www.nhc.noaa.gov/archive/2012/al18/al182012.discus.002.shtml (accessed 23 October 2012).

Pearce, L. (2002). Disaster management and community planning, and public participation: how to achieve sustainable hazard mitigation. *Natural Hazards*, 28: 211–28.

Pearlman, L. A. (1995). Self-care for trauma therapists: ameliorating vicarious traumatization. In B. H. Stamm (ed.), *Secondary Traumatic Stress: Self-Care Issues for Clinicians, Researchers and Educators*. Lutherville, MD: Sidran Press, 51–64.

Pearlman, L. A. (1996). Psychometric review of the TSI Belief Scale, Revision L. In B. H. Stamm (ed.), *Measurement of Stress, Trauma, and Adaptation*. Lutherville, MD: Sidran Press, 415–17.

Pearlman, L. A. & Maclan, P. S. (1995). Vicarious traumatisation: an empirical study of the effects of trauma work on trauma therapists. Professional Psychology: Research and Practice, 26: 558–65.

Pearlman, L. A. & Saakvitne, K. W. (1995a). *Trauma and the Therapist: Countertransference and Vicarious Traumatization in Psychotherapy with Incest Survivors*. New York: W. W. Norton.

Pearlman, L. A. & Saakvitne, K. (1995b). Treating therapists with vicarious traumatization and secondary traumatic stress disorders. In C. R. Figley (ed.), *Compassion Fatigue: Coping with Secondary Traumatic Stress Disorder from Treating the Traumatized.* New York: Routledge, 150–77.

Pearlmann, L. A., & Saakvitne, K. W. (1995). Trauma and the therapist: Counter transference and vicarious traumatization in psychotherapy with incest survivors. New York: Norton.

Pepe, M. S. (2003). *The Statistical Evaluation of Medical Tests for Classification and Prediction.* Oxford: Oxford University Press.

Pfifferling, John-Henryand Gilley, Kay (2000). Overcoming compassion fatigue: When practicing medicine feels more like labor than a labor of love, take steps to heal the healer.American Academy of Family Physicians April http://www.aafp.org/fpm/20000400/39over.htm.

Phipps, A. B. & Byrne, M. K. (2003). Brief interventions for secondary trauma: review and recommendations. *Stress and Health*, 19: 139–47.

Pines, A. M. (1993). Burnout. In L. Goldberger & S. Breznitz (eds.), *Handbook of Stress: Theoretical and Clinical Aspects*, 2nd edn. New York: Free Press, 386–402.

Pines, A. M. & Aronson, E. (1988).*Career Burnout: Causes and Cures.* New York: Free Press.

Pines, A. M. & Maslach, C. (1978). Characteristics of staff burnout in a mental health setting. *Hospital and Community Psychiatry*, 29: 233–7.

Pincha C (2008). Gender-Sensitive Disaster Management: A Tool kit for Practitioners
.   Mumbai: Oxfam America and NANBAN Trust.

Plate, E., Merz, B. & Eikenberg, C. (1999). Natural Disaster: Strategies for Mitigation and Disaster Response. Deutsche – IDNDR-Reihe No. 17, Bonn.

Pope, K. S. & Feldman-Summers, S. (1992). National survey of psychologists' sexual and physical abuse history and their evaluation of training and competence in these areas. *Professional Psychology: Research and Practice*, 23 (5): 353–61.

Raquepaw, J. & Miller, R. (1989). Psychotherapist burnout: a componential analysis. *Professional Psychology: Research and Practice*, 20: 32–6.

Raup, D. (1992). *Extinction: "Bad Genes or Bad Luck"*. New York: W. W. Norton.

Reker, G. T. & Wong, P. T. P. (1984). Psychological and physical well-being in the elderly: the perceived well-being scale (PWB). *Canadian Journal on Aging*, 3: 23–32.

Remer, R. & Elliot, J. (1988). Characteristics of secondary victims of sexual assault. *International Journal of Family Psychiatry*, 9 (4): 373–87.

Resick, P. A. (1993). The psychological impact of rape. *Journal of Interpersonal Violence*, 8: 223–55.

Resick, P. A. & Calhoun, K. S. (2001). Posttraumatic stress disorder. In D. H. Barlow (ed.), *Clinical Handbook of Psychological Disorders*. New York: Guildford Publications, 60–113.

Resick, P. A., Falsetti, S. A., Resnick, H. S. & Kilpatrick, D. K. (1991). *The Modified PTSD Symptom Scale: Self Report*. St Louis, MO: University of Missouri.

Reynolds, C. F., Frank, E., Thase, M. E., Houck, P. R., Jennings, J. R., Howell, J. R., Lilienfeld, S. O. & Kupfer, D. J. (1987). Assessment of sexual function in depressed, impotent, and healthy men: Factor analysis of a brief sexual function questionnaire for men. *Psychiatry Research*, 24: 231–50.

Rich, K. D. (1997). Vicarious traumatization: a preliminary study. In S. B. Edmunds (ed.), *Impact: Working with Sexual Abusers*. Brandon, VT: Safer Society Press, 75–88.

Riggs, D. S., Byrne, C. A., Weathers, F. W. & Litz, B. T. (1998). The quality of the intimate relationships of male Vietnam veterans: problems associated with posttraumatic stress disorder. *Journal of Traumatic Stress*, 11 (1): 87–101.

Roberts, W. R., Penk, W. E., Gearing, M. L., Robinowitz, R., Dolan, M. P. & Patterson, E. T. (1982). Interpersonal problems of Vietnam combat veterans with symptoms of posttraumatic stress disorder. *Journal of Abnormal Psychology*, 91 (6): 444–50.

Rodolfa, E. R., Kraft, W. A. & Reilley, R. R. (1988). Stressors of professionals and trainees at APA-approved counselling and VA medical centre internship sites. *Professional Psychology: Research and Practice*, 19: 43–9.

Rosenbloom, D. J., Pratt, A. C. & Pearlman, L. A. (1995). Helpers' responses to trauma work: understanding and intervening in an organization. In B. H. Stamm (ed.), *Secondary Traumatic Stress: Self-Care Issues for Clinicians, Researchers and Educators*. Lutherville, MD: Sidran Press, 65–79.

Ross, R., Altmeier, E. & Russell, D. (1989). Job stress, social support and burnout among counseling center staff. *Journal of Counseling Psychology*, 36: 464–70.

Roth, S. & Cohen, L. J. (1986). Approach, avoidance, and coping with stress. *American Psychologist*, 41 (7): 813–19.

Rubin, A. & Babbie, E. (1997). *Research Methods for Social Work*, 3rd edn. Pacific Grove, CA: Brooks/Cole.

Rudolph, J. M. & Stamm, B. H. (1999). Maximizing human capital: moderating secondary traumatic stress through administrative and policy action. In B. H. Stamm (ed.), *Secondary Traumatic Stress: Self-Care Issues for Clinicians, Researchers, and Educators*, 2nd edn. Lutherville, MD: Sidran, 277–90.

Rudolph, J. M., Stamm, B. H. & Stamm, H. E. (1997). Compassion fatigue, a concern for mental health policy, providers and administration. Poster presented at the 13th Annual Meeting of the International Society for Traumatic Stress Studies, Montreal.

Sabin-Farrell, R. & Turpin, G. (2003). Vicarious traumatization: implications for the mental health of health workers. *Clinical Psychology Review,* 23: 449–80.

Sack, W. H., Seeley, J. R. & Clarke, G. N. (1997). Does PTSD transcend cultural barriers? A study from the Khmer Adolescent Refugee Project. *Journal of the American Academy of Child and Adolescent Psychiatry,* 36: 49–54.

Salston, M. & Figley, C. R. (2003). Secondary traumatic stress effects of working with survivors of criminal victimization. *Journal of Traumatic Stress,* 16 (2): 167–74.

Sanders, S., Jacobson, J. M. &Ting, L. (2005). Reactions of mental health social workers following a client suicide or attempt: a qualitative investigation. *Omega: Journal of Death and Dying,* 51: 197–216.

Sarwer, D. B. & Durlak, J. A. (1996). Childhood sexual abuse as a predictor of adult female sexual dysfunction: a study of couples seeking sex therapy. *Child Abuse & Neglect,* 20 (10): 963–72

Saunders, T., Driskell, J. E., Johnston, J. & Salas, E. (1996). The effect of stress inoculation training on anxiety and performance. *Journal of Occupational Health Psychology,* 1: 170–86.

Saupp, H. (2002). The German Public Safety (BOS) timetable for implementing a digital radio communication network. http://www.pilotprojekt-digitalfunk-aachen.de/beitraege.htm

Schwarzer, R. (Ed.) (1992). *Self-efficacy: Thought control of action.* Washington, DC: Hemisphere

Schauben, L. J. & Frazier, P. A. (1995). Vicarious trauma: the effects on female counselors of working with sexual violence survivors. *Psychology of Women Quarterly,* 19: 49–64.

Schendel, J. D. & Hagman, J. D. (1982). On sustaining procedural skills over a prolonged retention interval. *Journal of Applied Psychology*, 67: 605–610.

Schler, K., Gilner, F., Austin, H. & Davenport, D. G. (1982). Contribution to the education phase to stress-inoculation training. *Psychology Reports*, 51: 611–17.

Schulman, L. (2006). *The Skill of Helping Individuals, Families, Groups and Communities*, 5th edn. Belmont, CA: Brooks/Cole.

Selye, H. (1956). *The Stress of Life*. New York: McGraw-Hill.

Selye, H. (1975). Confusion and controversy in the stress field. *Journal of Human Stress*, 1: 37–44.

Selye, H. (1976). *The Stress of Life*, revised edition. New York: McGraw-Hill.

Selye, H. (1982). History of the stress concept. In L. Goldberger & S. Breznitz (eds.), *Handbook of Stress: Theoretical and Clinical Aspects*. New York: Free Press.

Sexton, L. (1999). Vicarious traumatisation of counsellors and effects on their workplaces. *British Journal of Guidance & Counselling, 27* (3): 393–404.

Shaw, M. E. , & *Penrod*, W. T. (*1964*). Group effectiveness as a function of amount of "legitimate" information. Journal of Social Psychology , 62, 241-2.

Singer, R. N., Cauraugh, J. H., Murphy, M., Chen, D. & Lidor, R. (1991). Attentional control, distracters, and motor performance. *Human Performance*, 4: 55–69.

Slattery, S. & Goodman, A. (2009). Secondary traumatic stress among domestic violence advocates: workplace risk and protective factors. *Violence Against Women*, 15 (11): 358–79.

Smith, R. E. (1980). A cognitive-affective approach to stress management training for athletes. In C. H. Nadeau & W. R. Hallowell (eds.), *Psychology of Motor Behaviour and Sport*. Champaign, IL: Human Kinetics, 54–73.

Spanier, G. B. (1976). Measuring dyadic adjustment: new scales for assessing the quality of marriage and similar dyads. *Journal of Marriage and the Family*, 38: 15–28.

Spector, P. E. (1992). *Summated Rating Scale Construction: An Introduction*. Newbury Park, CA: Sage.

Spilman, S. K. (2006). Child abduction, parents' distress, and social support. *Violence and Victims*, 21: 149–65.

Sprang, G., Clark, J. J. & Whitt-Woosley, A. (2007). Compassion fatigue, compassion satisfaction, and burnout: factors impacting a professional's quality of life. *Journal of Trauma and Loss*, 12: 259–80.

Stamm, B. H. (ed.) (1995). *Secondary Traumatic Stress: Self-Care Issues for Clinicians, Researchers and Educators*. Lutherville, MD: Sidran Press.

Stamm, B. H. (ed.) (1996). *Measurement of Stress, Trauma and Adaptation*. Lutherville, MD: Sidran Press.

Stamm, B. H. (1997). Work-related secondary traumatic stress. *PTSD Research Quarterly*, 8: 25–34.

Stamm, B. H. (ed.) (1999). *Secondary Traumatic Stress: Self-Care Issues for Clinicians, Researchers and Educators*, 2nd edn. Lutherville, MD: Sidran Press.

Stamm, B. H. (2002). Measuring compassion satisfaction as well as fatigue: developmental history of the compassion fatigue and satisfaction test. In C. R. Figley (ed.), *Treating Compassion Fatigue*. London: Routledge, 107–19.

Stamm, B. H. (2005). Professional Quality of Life Scale: Compassion Satisfaction, Burnout and Fatigue Scale. Version IV. http://www.isu.edu/~bhstamm (accessed 1 April 2006).

Stamm, B. H. (2005). *The ProQOL Manual: The Professional Quality of Life Scale: Compassion Satisfaction, Burnout and Compassion Fatigue/Secondary Trauma Scales*. Baltimore, MD: Sidran Press.

Stamm, B. H. & Pearce, F. W. (1995). Creating virtual community: telemedicine applications for self-care. In B. H. Stamm (ed.), *Secondary Traumatic Stress: Self-Care Issues for Clinicians, Researchers and Educators*. Lutherville, MD: Sidran Press, 179–210.

Staw, B. M., Sandelands, L. E. & Dutton, J. E. (1981). Threat-rigidity effects in organizational behaviour: a multi-level analysis. *Administrative Science Quarterly*, 26: 501–24.

Stebnicki, M. A. (2000). Stress and grief reactions among rehabilitation professionals: Dealing effectively with empathy fatigue. *Journal of Rehabilitation*, 66 (1): 23–30.

Steed, L. & Bicknell, J. (2001). Trauma and the therapist: the experience of therapists working with the perpetrators of sexual abuse. *The Australasian Journal of Disaster and Trauma Studies*, 1: 1–9.

Steed, L. G. & Downing, R. (1998). Vicarious traumatisation amongst psychologists and professional counsellors working in the field of sexual abuse/assault. *The Australasian Journal of Disaster and Trauma Studies*, 2: 1–9. Available at: http://www.massey.ac.nz/~trauma.

Stein, M. B., Jang, K. L., Taylor, S., Versonon, P. A. & Livesley, W. J. (2002). Genetic and environmental influences on trauma exposure and posttraumatic stress disorder symptoms: a twin study. *American Journal of Psychiatry*, 159: 1675–81.

Sterling, P. & Eyer, J. (1988). Allostasis: a new paradigm to explain arousal pathology. In S. Fisher & J. Reason (eds.), *Handbook of Life Stress, Cognition and Health*. New York: Wiley, 629–49.

Stephenson, R. S. & DuFranc, C. (2002). *Disasters and Development, Part 2: Understanding and Exploiting Disaster–Development Linkages.* http://pdm.medicine.wisc.edu/20–1%20PDFs/ContEd.pdf (accessed 23 January 2008).

Stevens, J. (2002). *Applied Multivariate Statistics for the Social Sciences*, 4th edn. Mahwah, NJ: Lawrence Erlbaum.

Stroebe, W., Stroebe, M. & Abakoumkin, G. (1999). Does differential social support cause gender differences in bereavement outcome? *Journal of Applied Social and Community Psychology*, 9: 1–12.

Suinn, R. M. (1990). *Anxiety Management Training*. New York: Plenum.

Switzer, G. E., Dew, M. A., Thompson, K., Goycollea, J. M., Derricott, T. & Mullins, S. D. (1999). Posttraumatic stress disorder and service utilization among urban mental health center clients. *Journal of Traumatic Stress*, 12 (1): 25–39.

Szalma, J. L. & Hancock, P. A. (2007). Task loading and stress in human–computer interaction: theoretical frameworks and mitigation strategies. In A Sears & J. Jacko (eds.), *The Human–Computer Interaction Handbook*, 2nd edn. Mahwah, NJ: Erlbaum.

Tabachnik, B. G. & Fidell, L. S. (1996). *Using Multivariate Statistics*, 3rd edn. New York: HarperCollins.

Taylor, J. F., Rosen, R. C. & Leiblum, S. R. (1994). Self-report assessment of female sexual function: psychometric evaluation of the brief index of sexual functioning for women. *Archives of Sexual Behavior*, 23 (6): 627–43.

Thelen, M., Sherman, M. D. & Borst, T. S. (1998). Fear of intimacy and attachment among rape survivors. *Behavior Modification*, 22 (1): 108–16.

Thyer, B., Papsdorf, J., Davis, R. & Vallecorsa, S. (1984). Autonomic correlates of the subjective anxiety scale. *Journal of Behavior Therapy and Experimental Psychiatry*, 15: 3–7.

Ting, L., Jacobson, J. M., Sanders, S., Bride, B. E. & Harrington D. (2005). The secondary traumatic stress scale (STSS): confirmatory factor analysis with a national sample of mental health social workers. *Journal of Human Behavior in the Social Environment*, 11 (3/4): 177–94.

Ting, L., Sanders, S., Jacobson, J. M. & Power, J. R. (2006). Dealing with the aftermath: a qualitative analysis of mental health social workers' reactions after a client suicide. *Social Work*, 51: 329–341.

Trimble, L., Jackson, K. & Harvey, D. (2000). Client suicidal behavior: impact, interventions, and implications for psychologists. *Australian Psychologist*, 35: 227–32.

Tummino, T. (2000).Sermon delivered on 2nd April. Available at: http://www.religion/tumminot/cf.ts.

UNCRD Disaster Management Planning Hyogo Office (2003). *People, Communities and Disasters*. Proceedings of an international workshop on earthquake safer world in the 21st century, Kobe, Japan, February.

UNCRD Disaster Management Planning Hyogo Office . *Defining the Past and Building the Future of CHC 1188-I.*

UNDP (1994). *Disaster Mitigation.* Cambridge.

UNDP (2001a). *Disaster Profiles of the Least Developed Countries.* Geneva: UNDP.

UNDP (2001b). *From Relief to Recovery: The Gujarat Experience*. UNDP Emergency Response Division.

United Nations (1989). International Decade for Natural Disaster Reduction. General Assembly Resolution 44/236.

United Nations (1994). World Conference on Natural Disaster Reduction, Yokohama Strategy and Plan of Activities of a Saver World – Guidelines for Natural Disaster Prevention, Preparedness and Mitigation. Yokohama.

United Nations (1999). International Decade for Natural Disaster Reduction: Successor Arrangements. General Assembly Resolution 54/219.

USAID (n.d.). *Field Operations Guide for Disaster Assessment and Response (FOG Version 3.0)*. Washington, DC: Bureau for Humanitarian Response, Office of Foreign Disaster Assistance, in cooperation with and produced by the USDA Forest Service International Programs. http://www.usaid.gov/ofda/fog/fog_v3.pdf

Valent, P. (1995). Survival strategies: a framework for understanding secondary traumatic stress and coping in helpers. In C. R. Figley (ed.), *Compassion Fatigue: Coping with Secondary Traumatic Stress Disorder*. New York: Routledge, 21–50.

Van Berlo, W. & Ensick, B. (2000). Problems with sexuality after sexual assault. *Annual Review of Sex Research*, 11: 235–57.

Van Deusen, K. M. & Way, I. (2006). Vicarious trauma: an exploratory study of the impact of providing sexual abuse treatment on clinicians' trust and intimacy. *Journal of Child Sexual Abuse*, 15 (1): 69–85.

Van Minnen, A. & Keijsers, P. (2000). A controlled study into the (cognitive) effects of exposure treatment on trauma therapists. *Journal of Behavior Therapy and Experimental Psychiatry*, 31: 189–200.

Vaughn, M. J. & Matyastik Baier, M. E. (1999). Reliability and validity of the relationship assessment scale. *The American Journal of Family Therapy*, 27 (2): 137–47.

Veltman, J. A. & Gaillard, A. W. K. (1997). Dissociation between tasks demands and mental effort. Proceedings of the International Ergonomics Association, Tampere, FL, 29 June–4 July, 283–5.

Vingerhoets, A. J. & Van Heck, G. L. (1990). Gender, coping and psychosomatic symptoms. *Psychological Medicine*, 20: 125–35.

Wachtel, P. L. (1968). Anxiety, attention and coping with threat. *Journal of Abnormal Psychology*, 73: 137–43.

Walton, J. (2002). Discovering meaning and purpose during recovery from an acute myocardial infarction. *Dimensions of Critical Care Nursing*, 21 (1): 36–49.

Warfield, C. (2005). *The Disaster Management Cycle*. http://www.gdrc.org/uem/disasters/1–dm_cycle.html (accessed 23 January 2008).

Wasco, S. M. & Campbell, R. (2002). Emotional reactions of rape victim advocates: a multiple case study of anger and fear. *Psychology of Women Quarterly*,   26 (2): 120–30.

Way, I., Van Deusen, K. M., Martin, G., Applegate, B. & Jandle, D. (2004). Vicarious trauma: a comparison of clinicians who treat survivors of sexual abuse and sexual offenders. *Journal of Interpersonal Violence*, 19(1): 49–71.

Weave, J. L., Morgan, B. B., Jr., Adkins-Holmes, C. & Hall, J. K. (1992). A review of potential moderating factors in the stress–performance relationship 92. Orlando, FL: Naval Training Systems Centre.

Wee, D.F., & Myers, D. (2002). Stress responses of mental health workers following disaster: The Oklahoma City bombing. In C.R.Figley (Ed.), Treating   compassion fatigue (pp. 57–83). New York: Brunner-Routledg .

Weiner W. (1989). Is burnout an institutional syndrome? *Loss, Grief and Care* 3: 95–100.

Weiss, D. S. & Marmar, C. R. (1997). The impact of event scale: revised. In J. P. Wilson & T. M. Keane (eds.), *Assessing Psychological Trauma and PTSD*. New York: Guildford Press, 399–411.

Weyrauch, K. E., Roy-Byrne, P., Katon, W. & Wilson, L. (2001). Stressful life events and impulsiveness in failed suicide. *Suicide and Life-Threatening Behavior*, 31: 311–19.

White, G. D. (1998). Trauma treatment training for Bosnian and Croatian mental health workers. *American Journal of Orthopsychiatry*, 68: 58–62.

Wiebe, R. L. (2001). The influence of personal meaning on vicarious traumatization in therapists. Unpublished Master's thesis, Trinity Western University, Langley, BC, Canada.

Williams, M. B. & Sommer, J. F. (1995). Self-care and the vulnerable therapist. In B. H. Stamm (ed.), *Secondary Traumatic Stress: Self-Care Issues for Clinicians. Researchers and Educators*. Lutherville, MD: Sidran Press, 230–46.

Wilson, J. P. & Lindy, J. D. (eds.) (1994). *Countertransference in the Treatment of PTSD*. New York: Guildford Press.

Wilson, J. P. & Raphael, B. (eds.) (1993). *International Handbook of Traumatic Stress Syndromes*. New York: Plenum.

Wisner, B., Westgate, K. & O'Keefe, P. (1976). Poverty and disaster. *New Society*, 9: 547–8.

Wong, P. T. P. (1998). Meaning centered counselling. In P. T. P. Wong & P. S. Fry (eds.), *The Human Quest for Meaning: A Handbook of Psychological Research and Clinical Applications*. Mahwah, NJ: Lawrence Erlbaum, 395–435.

World Bank (2000). *Managing Disaster Risk in Emerging Economies*. Disaster Risk Management Series No. 2.

World Bank (2001). *World Disasters Report 2001*. Washington, DC: World Bank.

Worldwatch Institute (2001). *State of the World 2001 – A Worldwatch Institute Report on Progress Toward a Sustainable Society*. New York: Earthscan.

Yassen, J. (1995). Preventing secondary traumatic stress disorder. In C. R. Figley (ed.), *Compassion Fatigue: Coping with Secondary Traumatic Stress Disorder*. New York: Routledge, 178–208.

Yehuda, R. (ed.) (1999). *Risk Factors for Post-Traumatic Stress Disorder*. Washington, DC: American Psychiatric Press.

Yule, W (ed) (1999). Post traumatic stress disorders. Concepts and Therapy. Wiley

Zajonc, R. B. (1965). Social facilitation. *Science*, 149: 269–74.

Zimering, R., Munroe, J. & Gulliver, S. B (2003). Secondary traumatization in mental health care providers. *Psychiatric Times*, 20(4).

Zisook, S., Shuchter, S. R. & Mulvihill, M. (1990). Alcohol, cigarette, and medication use during the first year of widowhood. *Psychiatric Annals*, 20: 318–26.

Additional useful internet addresses:

Asian Disaster Preparedness Centre http://www.adpc.ait.ac.th Asian Disaster Reduction Centre http://www.adrc.or.jp/top.asp

Caribbean Disaster Mitigation Project http://www.oas.org/EN/CDMP Caritas

Centro de Coordinación para la Prevención de los Desastres Naturales en América Central (CEPREDENAC) http://www.cepredenac.org

Centro Régional de Información sobre Desastres (América Latina y el Caribe) http://www.disaster.info.desastres.net/crid

Directory for Disaster Reduction Institutionsm http://www.unige.ch/idndr

Disaster Information Network http://www.disaster.net

Disaster Relief – Worldwide Disaster Aid and Information via the Internet
http://www.disasterrelief.org

Earthquake Research Institute http://www.eri.u–tokyo.ac.jp

International Strategy for Disaster Reduction http://www.unisdr.org

UN Development Programme • Disaster Management http://www.undp.org/erd/disaster.htm

Disaster Management Programme http://www.undp.org/erd/dmp.htm

GIS relevant references:
http://www.esri.com/what–is–gis/overview.html#overview_panel
http://www.answers.com/topic/spatial–analysis–1#ixzz1y6JV5Wtf
http://www.answers.com/topic/spatial–analysis–1#ixzz1yGfe1zQ0
http://webhelp.esri.com/arcgisserver/9.2/dotnet/manager/concepts/whats_server.htm
http://edndoc.esri.com/arcobjects/9.2/CPP_VB6_VBA_VCPP_Doc/shared/desktop/get_started/what_is_d
top.htm
http://webhelp.esri.com/arcgisdesktop/9.3/index.cfm?TopicName=What_is_Ar cSDE?
http://www.esri.com/library/brochures/pdfs/arcims_bro.pdf

APPENDICES

Appendix 1

GENERAL HEALTH QUESTINNAIRE (GHQ)

(Goldberg & Hillier,1979)

ID: **Gender: Age:**

Education Level:

Please read this carefully:
We should like to know if you have had any medical complaints, and how your health has been in general, over the past few weeks. Please answer ALL the questions on the following pages simply by underlining the answer which you think most nearly applies to you. Remember that we want to know about present and recent complaints, not those you had in the past. It is very important that you try to answer ALL the questions.

Thank you very much for your co-operation.

HAVE YOU RECENTLY:

1	been able to concentrate on whatever you're doing?	Better than usual	Same as usual	Less than usual	Much less than usual
2	lost much sleep over worry?	Not at all	No more than usual	Rather more than usual	Much more than usual
3	been having restless, disturbed nights?	Not at all	No more than usual	Rather more than usual	Much more than usual
4	been managing to keep yourself busy and occupied?	More so than usual	Same as usual	Rather less than usual	Much less than usual
5	been getting out of the house as much as usual?	More so than usual	Same as usual	Less than usual .	Much less than usual

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6	been managing as well as most people would in your shoes?	Better than most	About the same	Rather less well	Much less than usual
7	felt on the whole you were doing things well?	Better than usual	About the same	Less well than usual	Much less well
8	been satisfied with the way you've carried out your task?	More satisfied	About the same as usual	Less satisfied than usual	Much less satisfied
9	been able to feel warmth and affection for those near you?	Better than usual	About the same as usual	Less well than usual	Much less well
10	been finding it easy to get on with other people?	Better than usual	About the same as usual	Less well than usual	Much less well
11	spend much time chatting with people?	More time than usual	About same as usual	Less time than usual	Much less than usual
12	felt that you are playing a useful part in things?	More so than usual	Same as usual	Less useful than usual	Much less useful
13	felt capable of making decisions about things?	More so than usual	Same as usual	Less so than usual	Much less capable
14	felt constantly under strain?	Not at all	No more than usual	Rather more than usual	Much more than usual
15	felt you couldn't overcome your difficulties?	Not at all	No more than usual	Rather more than usual	Much more than usual
16	been finding life a struggle all the time?	Not at all	No more than usual	Rather more than usual	Much more than usual
17	been able to enjoy your normal day-to-day activities?	More so than usual	Same as usual	Less so than usual	Much less than usual
18	been taking things hard?	Not at all	No more	Rather more	Much more

			than usual	than usual	than usual
19	been getting scared or panicky for no good reason?	Not at all	No more than usual	Rather more than usual	Much more than usual
20	been able to face up to your problems?	More so than usual	Same as usual	Less able than usual	Much less able
21	found everything getting on top of you?	Not at all	No more than usual	Rather more than usual	Much more than usual
22	been feeling unhappy and depressed?	Not at all	No more than usual	Rather more than usual	Much more than usual
23	been losing confidence in yourself?	Not at all	No more than usual	Rather more than usual	Much more than usual
24	been thinking of yourself as a worthless person?	Not at all	No more than usual	Rather more than usual	Much more than usual
25	felt that life is entirely hopeless?	Not at all	No more than usual	Rather more than usual	Much more than usual
26	been feeling hopeful about your own future?	More so than usual	About same as usual	Less so than usual	Much less hopeful
27	been feeling reasonably happy, all things considered?	More so than usual	About same as usual	Less so than usual	Much less than usual
28	been feeling nervous and strung-up all the time?	Not at all	No more than usual	Rather more than usual	Much more than usual
29	felt that life isn't worth living?	Not at all	No more than usual	Rather more than usual	Much more than usual
30	found at times you couldn't do anything because your nerves were too bad?	Not at all	No more than usual	Rather more than usual	Much more than usual

THANK YOU FOR YOUR CO-OPERATION IN THIS RESEARCH

دَوْلَةُ الْإِمَارَاتُ الْعَرَبِيَّةُ الْمُتَّحِدَةُ
وَزَارَةُ الدَّاخِلِيَّةِ
الْقِيَادَةُ الْعَامَّةُ لِشُرْطَةِ أَبُوظَبِيّ

Date: / / 2012

Ref: Ethical Clearance

To Whom it May Concern

Research Title: 'An Investigation into Stress Level and Evaluation of Core Skills Among Staff Working in Various Emergency Operation Services and Disaster Response Teams in Abu Dhabi'

مهارات ومستوى ضغوط فرق طواقم الطوارىء والكوارث في ابو ظبي

Author and Research Investigator: Mr Ahmed Nasser Al Raisi

I am writing to confirm that the Abu Dhabi Police, GHQ has no objection to provide the above research investigator an access to departments and staff; and hence to collect the main –required- data that are related and/or useful to this research project.

Also I have no reason to believe that access to relevant sample, material and this research project in particular would violate any ethical standard or professional code of practice.
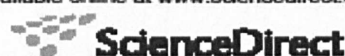
Due to the above reason and the usefulness of this research work clearance is granted.

Staff Major General Obaid Al Ketbi
Deputy Gen. Commander of Abu Dhabi Police

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Iris recognition and the challenge of homeland and border control security in UAE

Ahmad N. Al-Raisi, Ali M. Al-Khouri *

Abu Dhabi Police GHQ, Ministry of Interior, Abu Dhabi, United Arab Emirates

Abstract

This article discusses the implementation of iris recognition in improving the security of border control systems in the United Arab Emirates. The article explains the significance of the implemented solution and the advantages the government has gained to-date. The UAE deployment of iris recognition technology is currently the largest in the world, both in terms of number of Iris records enrolled (more than 840,751) and number of iris comparisons performed daily 6,225,761,155 (6.2 billion) in 'all-against-all' search mode.
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Keywords: Border control; Homeland security; Biometrics; Iris recognition

1. Introduction

Today, security has become a top priority subject on many countries' agendas, as governments find themselves faced with continuous radical strategic challenges related to identity management and verification. Despite the fact that they will not be a panacea in every case, biometric technologies are at the forefront of these agenda discussions since they provide a highly accurate identity confirmation which makes it to be seen as a very effective answer to many security and identity management impediment issues.

Recent advances in technology coupled with a significant price drop, and fuelled by the legislative requirements for positive identification and verifications, biometric industry is tremendously growing with an ever increasing market share as a viable alternative to upgrade security levels in local, regional and national security checkpoints.

The term *biometrics* refers to a wide range of technologies available in the market to identify and verify a person's identity by means of measuring and analysing various human physiological and behavioural characteristics.

In order to make a decision of which biometric product or combination of products would satisfy stated requirements, different factors need to be assessed. Factors for consideration would typically include accuracy

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Public Value and ROI in the Government Sector

Ahmad N. Al-Raisi, and Ali M. Al-Khouri

Abstract—Assessing the returns of public sector investments in Information Technology (IT) has been the subject of a round of debates between practitioners and the academic researchers. The range and complexity of government Information Technology (IT) investments and broad community of benefit owners makes assessing investment returns a daunting prospect. This paper provides a short review of existing literature on Public Return on Investment (ROI) and the general approaches to measurement of such returns. It also presents some examples of successful Public ROI programs and practices in the United Arab Emirates (UAE). The intention of this paper is to share experience and knowledge with the wider research and practitioner community in different governments.

Keywords—Public Value, ROI, Government Projects.

I. INTRODUCTION

THE substantial scale of expenditure and the scope of government sector investment in IT are receiving increasing scrutiny in many of countries. Governments are criticised for not accurately measuring the full value of their IT investments, and hence wasting government funds on unnecessary technology. It is often repeated in the literature that governments at large are unable to convincingly demonstrate a return on investment that is widely understood or based upon well-grounded measures [1]. This might be linked somehow to the myths regarding the use of ROI in government, which might be preventing many agencies from the development of comprehensive approaches to evaluating their initiatives, such as:

- Government will never require the use of ROI;
- Absences of revenues and profits make the concept of ROI inappropriate;
- Little or no hard data in government organisations;
- ROI methodology inappropriate for essential government services.

The global environment is indeed playing an immense role in changing government organisations practices and acceptance of new concepts that were only limited to private sector organisations. It is understood that every government IT project will have its own unique goals, value propositions, and stakeholders, but assessing these returns remains a core problem in IT planning and decision making [2].

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Ali M. Al-Khouri is with Emirates Identity Authority, P.O. Box 27126, Abu Dhabi, UAE (Work +9712 404 6775, Fax: +9712 404 6768, e-mail: ali.alkhouri@emiratesid.ae).
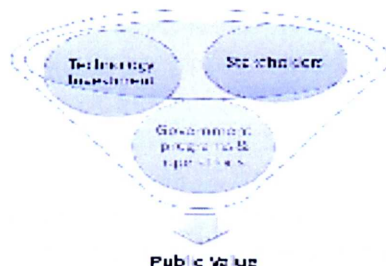

Fig. 1 Project constituents and public value

Traditional ROI approaches concentrated on cost-benefit analysis. These methods can be seen as limited when it comes to measuring risk, indirect benefits and intangible benefits [3]. It is widely argued that government IT initiatives that have been cost-justified by traditional economic and financial return methods are unlikely to achieve their targets. The concept of public value and public ROI are new terms used in the government sector to justify IT investments. The new practices of ROI analysis in public sector encompass all of the direct and indirect effects of government IT spending i.e., "public value of IT. The definition of pubic value of IT involves the study of value primarily along three dimensions: constituent service, operational efficiency and political return, as the next section will provide further elaboration on this.

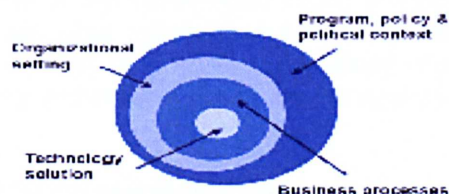## II. REVIEW OF THE FIELD

Fig-2: Complexity layers surrounding government IT initiatives

Investment decisions in the public sector, whether they involve IT or not, should necessarily take place in a context of political and policy influences (see also Fig-2). No matter how

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INTRODUCTION

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Investment decisions in the public sector, whether they involve IT or not, should necessarily take place in a context of political and policy influences (see also Fig-2). No matter how solid or technically sophisticated an ROI analysis may be, it is seldom the sole determinant of an investment decision especially in the government sector. Nonetheless, and historically, governments have measured the performance of IT initiatives with quantifiable, financially based outcomes, such as reduced transaction costs or cost avoidance. Of course, financial measures should be used in government, but they seldom represent the full range of returns generated from public investments in IT (see also Fig-3).
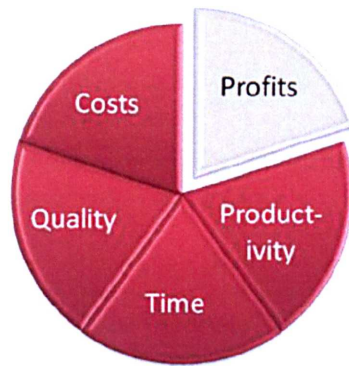
Fig-3: Pubic ROI elements

It should also be recognised that the range, scale and complexity of government information technology (IT) investments makes assessment of their returns using conventional approaches a complex and challenging prospect. The complexity results from shortcomings in the available methods and models for assessing public returns i.e. intangibility of the benefits generated, the time at which benefits can be measured, and the cross-sectional nature of information technology project. Measuring the return on IT investment in general is a complex and requires a thorough understanding and knowledge of both the business process and the context in which it is embedded. It is necessary to understand the relationships between the costs, benefits and risks of IT investments, as well as the different contextual factors including organisational, institutional, and environmental. Traditional approaches to return on investment analysis have been criticised [4, 5] for being:

a) Based on financial models,
b) Not being able to accurately predict ROI due to uncertainty and difficult decisions involved in IT investments,

While financial measures would remain important, research emphasises the need for more comprehensive approaches to measure the extent to which government programs impact the world around them [7]. In a response to such need, SAP, the world's largest business software company, developed a holistic approach consisting of three dimensions of performance and public sector entities that can be used to measure public ROI i.e., Financial ROI, Social ROI and Political ROI, as depicted in Fig-4 [9].
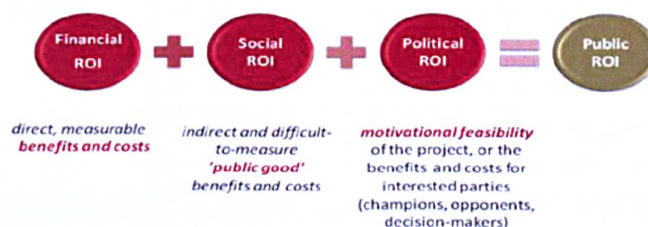

Fig-4: The three dimensions of public ROI

The concept is argued to:

a) Demonstrate trustworthiness to citizens,
b) Ensure governance in the value of operations,

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c) Promote positive community programs to business constituents and

d) Gain an advantage in securing public funds.

Although it considers Financial ROI a key dimension of a government's effectiveness, it puts much emphasis on the social and political value of public programs.

In common with governments around the world public sector organisations in the UAE are under pressure to improve the efficiency and effectiveness of their processes and delivery of public services. The concept of customer service is being brought into the centre of the value proposition equilibrium in government systems. An important paradigm shift taking place in the UAE public sector organisations in recent years is the shift from an activity-based to a result/outcome-based focus. This is guided by the government's vision to excel at customer service, promote innovation and creativity in public sector [10] and make a tangible difference to the society that it serves(see also Table-3).

The SAP concept has gone through further research by the Centre for Technology in Government for assessing public return on investment (ROI) for IT initiatives. This exercise resulted in the development of a Public ROI framework, as depicted in Table-2 [8]. The framework describes public value in terms of six kinds of impacts governments might have on the interests of public stakeholders. It views Public (e.g., citizens, businesses, and community organisations) as the basis for return for IT investment assessment, rather than the technology development and implementation. It identifies two sources of public returns as value to the public that primarily results from: (1) improving the government itself, and value that results from, and (2) delivering specific benefits directly to citizens. The next section will present some insights from the United Arab Emirates related to the concept and application of *public value* in government projects.

TABLE 2
STAKEHOLDER VALUE PROPOSITION

Financial	Can we afford this? Will it pay for itself? Is it based on expected savings and revenue increases compared to the dollar cost of all expenditures on the new system? Impact on income, asset values, liabilities, entitlements, and other kinds of wealth or risks to any of them
Political	Impacts on informed (i.e. the ability to influence) government actions and policy, government actions or policy.
Social	Impacts on family or community relationships, opportunity, status, or identity.
Strategic	Impacts on innovation and planning, economic or political advantage or opportunities for future gain. Focusing on strategic objectives keeps attention on the full range of benefits to be expected from the investment, and how to measure them.
Ideological	Impacts on beliefs, moral or ethical values, or positions in terms of public trust, integrity, and legitimacy.
Stewardship	Impacts on the public's view of government officials as faithful stewards in terms of public trust, integrity, and legitimacy.

Practices in the UAE government sector are becoming similar or aligned to those in the private sector. There is great interest in improving performance measurement in the UAE government through the adoption of total quality management (TQM), zero-based budgeting, and employing balanced scorecard methodologies.

It is recognised that these approaches need to be tailored to fit the needs of government. As an example zero-based budgeting is generally an activity-based approach. The UAE government is developing a hybrid methodology of activity and result-based approaches. The UAE government is using the former to control overall government spending and link it with top level strategic goals in each organisation and its programs. The result-based approach provides a broader, more diverse perspective of the value to citizens and/or to the societythat IT investments can

generate. The second paradigm shift is observed in the increasing interest of the UAE government of the concept of public private partnerships (PPPs) to finance and deliver various government infrastructure projects and services. Such steps have produced innovation and flexibility in public sector organisations. Private sector involvement has not only provided additional investment funding to government but. Government programs in the UAE public sector as illustrated from the examples provided above incorporate different dimensions of Public ROI returns. However, from our knowledge, public ROI is often not clearly thought through when government programs are first initiated. For example, many of the government IT projects worldwide when announced or implemented do not meet public expectations, and lead to hot public debates. The challenge of making a clear business case for IT projects is also linked to the limitation of existing knowledge and tools required for delivering complex programs and assessing resultant public value.

TABLE 4
PROJECTS WITH HIGH LEVEL OF ROI ON ALL THREE DIMENSIONS OF PERFORMANCE IN UAE

Project	Desc.	Spending returns
Salik toll system (www.salik.ae) Operated in Dubai	Electronic toll collection system on highway roads (A motorist pays Dh4 each time he drives through the gate) Aimed at reducing congestion at key and arterial/bottleneck points of traffic, encouraging motorists to use alternative routes i.e., other newer roads which have been built to handle such traffic	Sustaining the development of transport Infrastructure Programs
Electronic Number Auction (www.numbers.ae) **Abu Dhabi Police GHQ**	An electronic auction that provides an easy method of auctioning prime and desirable licence plate numbers to the general public The auction generated world record e.g., sold the Top Ten most expensive license plates in the world, including the Guinness record-breaking world's most expensive Plate '1' which sold for $14 million in Abu Dhabi in Feb. 2008.	100% of revenues go to charities Building one of the largest hospitals in the region to provide free treatment for those who suffer injuries from car accidents
SA'ED Project An independent company, operated by Abu Dhabi Police GHQ.	Abu Dhabi police outsourced entity 1st of its kind in the Middle East to offer a **hi-tech integrated vehicle accident management system** Electronically: filling of insurance claims, reporting incidents to insurance companies, and issuance of repair permits of damaged vehicles. Equipped with safety protection, 1'st aid, advanced electronic communication devices that are connected with the company and police operation rooms.	100% cut in administration and operational cost, as well petrol staff salaries. >60% faster response rate i.e., max 15 minutes for reaching the accident site, and document it. Police Traffic patrols are more focussed on security
Fast Service Counters	Dedicated offices and/or service lines provided at many of the public sector organisations (e.g., visa applications at immigration departments) for additional fees, but faster processing Processed normally instantaneously on spot or within 1hour (Regular and normal processing is more than 3 days).	Funding internal improvement projects and infrastructure.

Though some schools of thought argue for a holistic approach to ROI analysis, our experience suggests government should follow a more simple approach to understanding the value of the project at hand. We say this, because in most of the large government programs that we have participated in, it was difficult to *identify the unit of measure in the public sector*, mainly because the unit of measurement is not always financial, depending on the various levels of government. Social and political returns are often the basis for investment justification and business cases. These returns normally reflect the mandated government performance standards and the multi-dimensional benefits organisations need to deliver to constituents. Such benefits are however often difficult to quantify and measure making comprehensive assessment of ROI difficult.

However, measurement of financial returns is becoming a strategic dimension of evaluation of government IT projects, as large government programs have considerable long or short term revenues and/or reduction of operating cost. It is important to heed that the government sector in the UAE has focused to a large extent on financial measures for fiscal accountability but lacked measures of performance, benefits realisation and operational accountability until recently. Recent government policies promoted more responsible performance management and outcome measurement in the public sector both on operational and financial levels.

In a review of some of the recent government programs in the UAE, the value proposition is observed in two dimensions; improving service delivery and operational effectiveness and efficiency. However the business case and project justifications fail to place clear attention or evaluation effort to these dimensions in project planning through to project implementation. As explained earlier, this can be due to the complexities in quantifying the outcome related benefits of public sector IT projects. The following section provides a generic high level model for realising public value in government IT programs.

framework for strategic measurement and management. Operational and technology strategies need to be guided by such strategic performance measures. In fact it should be embedded in the heart of such strategies.

The program design and implementation phases should include a measurement system that focuses on outcome **'value'** and a modular approach to the delivery of benefits. The impact and value outcome are likely to yield a clearer more compelling measurement of public value and benefits. Clear articulation of outcomes and measures should lay down the foundation for both long-term improvements in program performance, return on investment, public accountability and public service delivery.

Public Value Chain – a simple approach
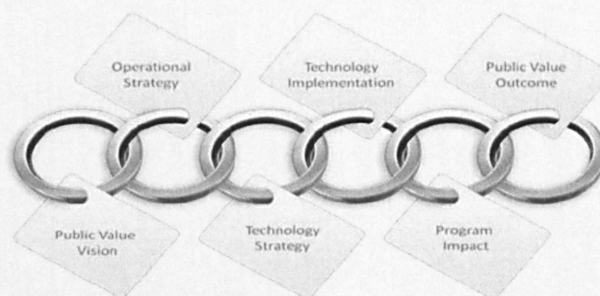
Fig-5: Public value chain

It can be seen that where the public value vision is in place in a government organisation's mission and strategy public value needs to be clearly translated into a comprehensive set of performance measures that should in turn provide .

Conclusion

Government organisations require contemporary approaches for assessing public value that matches their greater scope and complexity; an approach that can build the needed public support

and guide development. It is important that governments conduct further research to determine the usability of existing concepts, models and methodologies for developing and measuring returns from IT investment for the public sector. Knowledge about public value will contribute to guide other forms of investment and contribute to longer term government improvement, and provide a foundation for organisational learning and effective public sector management.

ACKNOWLEDGEMENT

REFERENCES

[1] Cresswell, A.M. The role of public return on investment assessment in government IT projects, Proceedings of the 2006 international conference on Digital government research, 2006.

[2] Wirick, D. Public-Sector Project Management: Meeting the Challenges and Achieving Results. John Wiley & Sons, New Jersey, 2009.

[3] Roulstone, B. and. Phillips, J. ROI for Technology Projects: Measuring and Delivering Value. Butterworth-Heinemann, Oxford, 2008.

[4] Arlotto, P.W., and Oakes, J.L. Return on Investment: Maximizing the Value of Healthcare Information Technology Healthcare Information and Management Systems Society, Chicago, Illinois, 2003, pp. 1-74.

[5] Benaroch, M., and Kauffman, R. 'Justifying Electronic Banking Network Expansion Using Real Options Analysis,' MIS Quarterly (24:2) 2000, pp 197-225.

[6] Dufner, D., Holley, L.M., and Reed, B.J. 'Can Private Sector Strategic Information Systems Planning Techniques Work for the Public Sector,' Communications of the Association for Information Systems (8) 2002, pp 413-431.

[7] Forrer, D.A., and Anderson, T.A. 'The Dichotomy of Measurement: Information Technology Return on Investment in the Public Sector,' Proceedings of the Twelfth Annual Conference of the Production and Operations Management Society, Orlando, Florida, 2001, pp. 1-10.

[8] Cresswell, A.M., Burke, G.B. and Pardo, T.A. Public ROI – Advancing Return on Investment Analysis for Government IT. Center for Technology in Government, University At Albany, 2006. Available from: http://www.ctg.albany.edu/publications/reports/advancing_r-oi/advancing_roi.pdf

Appendix 4

UAE Gate - A Facet of E-Government Services

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Abstract

This article discusses the implementation of electronic gate system (e-Gate) which is part of the E-government services in UAE. This service will facilitate the entry/exit of the passengers rapidly. It also explains the significance of the implemented solution and the advantages, the government has gained till date.

Keywords: Homeland security; Border control; Biometrics

1. Introduction

The increasing difficulty of international travel continues to place more pressure on those liable for securing national borders. Conventional approaches to immigration control have relied on paper-based passports and bulky visa processing. These travel documents are vulnerable to modification and the border authority's judgement is based on photographs as the primary form of identification. This imposes time-consuming process to verify identity.

As the air traffic is increasing day by day, the immigration clearance process (exit/entry) for the growing number of passengers will be very time consuming and cause bottlenecks at the airports.

To face this challenge, it was decided by the Ministry of interior to implement the service of e-gate system as a solution. The thought behind this electronic service (e-service) of electronic gate system (e-Gate) is to automate the passenger border access without any hassle. The e-Gate system allows travellers to acquire immigration clearance on entry or exit after having immigration travel business rules check with more speed and efficiency. e-Gate system verifies the identity of each traveller using a fingerprint for identity verification.

The e-service of electronic gates system in UAE, is a highly sophisticated robust system which helps to simplify the system procedures for travellers arriving and departing the UAE airports. Travellers will use their e-cards with the conformation of their finger prints as they pass through an e-gate. This will improve the earlier procedure of using their passports to enter or exit the country and to wait for long hours in queues to have their passports checked and stamped.

This new e-service of automated electronic gates will not only speed up the Exit/Entry of travellers, through the airports but will also act as predominant blockade for illegal travellers. Electronic gate system operates on the concepts of smart card with fingerprint identification to automate the registration process which guarantees that each traveller can only enrol once in the system.

2. Benefits of e-Gate

e-Gate implementation has streamlines the immigration Exit/Entry workflow keeping the effective security in place. This improves the services to passengers while maintaining comprehensive and integrated information. The system is able to retrieve, with the use of the e-card, all the information about the passenger; which is stored and secured in numerical form.

Only those passengers are allowed to Exit/Enter whose fingerprints match the enrolled identifications and satisfy the immigration business rules. Its creative design prevents anyone from illegally travelling under another's name.

It effectively prevents any illegal immigrant from entering the country. It ensures a smooth passage for passengers, even at times of peak hour crowding. It saves up passport pages, as they do not need to be stamped. It gives a good reputation to the country and its e-services. Important management information tools are available including historical and statistical analysis. For the operator it is very easy to use due to user-friendly Graphical User Interface (GUI).

Using of the e-gate with the e-card reduces the immigration time to 5-10 seconds as compare to the manual passport processing which usually takes 3-4 minutes. Using of e-Gates has eliminated the requirement for a passenger to produce a passport for immigration clearance. It is much faster and easy process for the passenger. Passengers are not required to queue up for immigration clearance.

Number of passengers clearing the immigration control has been increased significantly due to faster processing. The use of biometrics has intensified the security at immigration clearance. Moreover, considerable improvement in analysis and decision-making has been achieved with the help of Management Information System (MIS) reports.

3. Features of e-Gate

The system controls the passenger flow, allowing no more than one person to pass through the e-Gate at one time which eliminates the tailgating. The e-Gate is the only way for a passenger to pass through using the electronic card (e-card). The e-gate doors are kept closed for the passing passenger until the system indentifies the person properly. It checks and identify, if a passenger has left any luggage behind and blocks the passenger until the luggage is collected. It identifies the passenger at all UAE international airports after the passenger is enrolled once in the system. It reduces the whole process of passing through the e-Gate not more than 5 seconds.

4. e-Gate application technology

The system is built using multi-tier architecture and is the fundamental requirement for building a scalable application. Instead of designing an application to run solely on one computer, it is designed to run on multiple tiers of computers.

A multi-tier application is constructed across multiple logical or physical tiers. Historically, two-tier architecture, represented by the division between client-based work and server-based work was most common. Eventually, the three-tier architecture was constructed, moving business logic into a middle tier, sometimes placing it on a separate application server (see Figure 1).
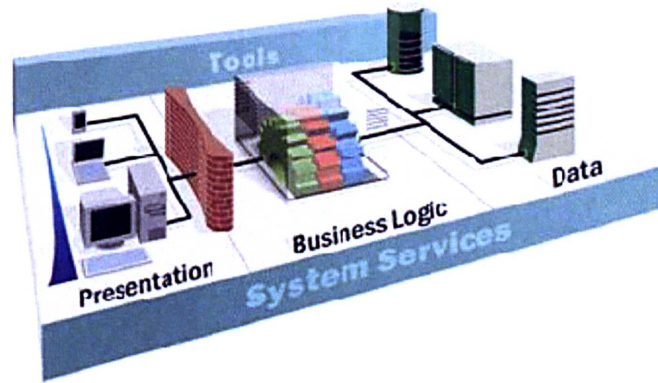
Figure 1

The logical architecture of the e-Gate application is consequently based on the following services layers:

User Services refer to units of application logic that provide a visual user interface to end users.

Web Services refer to application logic exposed as XML Web Services provided to other application services, either local or remote.

Business Services refer to units of application logic that control the sequencing and enforcing of business rules.

Data Services refer to units of application logic that provide the lowest visible level of detail used to manipulate data.

5. e-Gate application workflow overview

Following is the diagram (Figure 2) which shows the workflow model of the e-Gate application. Core functions of the workflow are Registration, Gate Access for both arrival & departure and Monitoring of gate activities.

Figure 2

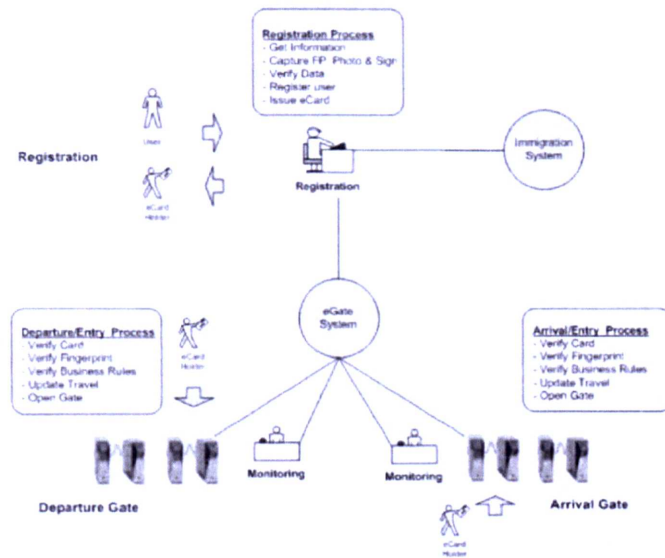## 6. e-Gate logical overview

In the following diagram (figure 3), shows the core e-Gate module and backend connectivity. In a typical e-Gate system there is at least one enrolment station, departure gate, arrival gate and monitoring station. It can be expanded according to the growing business needs as and when required.
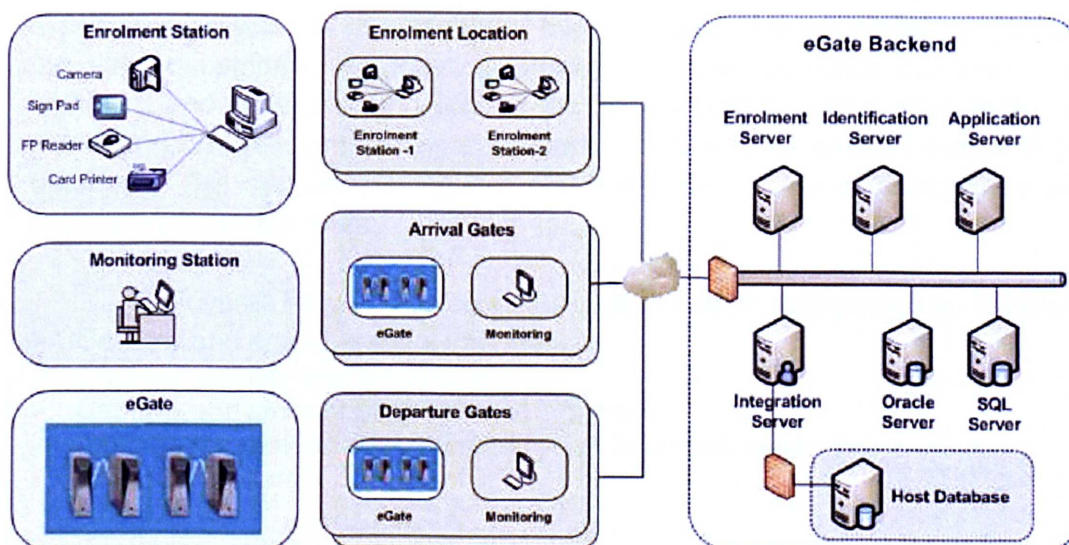

Figure 3

7. Accuracy and measurement of fingerprint matching

Fingerprint matching algorithms produce a score that reflects the degree of resemblance between the two compared prints. Very important characteristics of a fingerprint identification system are the two probability curves - False Accept Rate (FAR) and False Reject Rate (FRR) curves. These curves completely describe the verification accuracy of any biometric system. A False Accept Rate (FAR) curve symbolizes a probability that a non-matching fingerprint is considered a match (false fingerprint is accepted). A False Reject Rate (FRR) curve symbolizes a probability that a matching fingerprint is rejected by a fingerprint system (correct fingerprint is rejected). Based on configurations of these curves and the requirements of a specific application, a matching threshold is determined. The FAR and FRR curves, and a matching threshold depend on the specifics of the matching algorithm and the circulation of good/bad quality fingerprints in the database.

In less than one second, creation of template takes place. One-to-one matching done in less than 50 milliseconds and one-to-many matching takes place on 100,000 matched per second. On a single machine capacity of database size is 250,000. Template size is variable and can be as small as 125 bytes but the average size is 600 bytes. False Acceptance Rate (FAR) is <0.5% and False Rejection Rate (FRR) is <1%.

8. Modules and functions

a. Administration module
The administration module provides the functions to create user accounts, assigns user privileges and maintains master information.

b. Registration
The Registration process registers a user and gives the e-card. To acquire an e-card, the person has to visit any of the e-Gate registration offices, in person, with the valid documents. Registration process captures personal information, image, signature and fingerprint and applies the immigration business rules before issuing the e-card. The system confirms the captured fingerprint against central fingerprint database. The system will register and issue an e-card on compliance with the mandatory business rules.

The overall Registration procedure steps can be categorized as follows:
➢ Capture and enrol personal information.
➢ Capture, identify and enrol fingerprint.
➢ Capture and store photograph and signature.
➢ Validate information against immigration business rules.
➢ Printing of e-card.

c. Replace lost e-card
Applications for the replacement of lost e-cards have to be done in person. On receipt of the application at the e-Gate office, the card information will be verified against the e-Gate system and a new e-card will be provided.

d. Replacing damaged e-card

Applications are also processed to replace the damaged e-cards and should be done in person. The damaged card will be cancelled and a substitute e-card, provided.

e. Revoking e-card

Due to breach of immigration rules or illegal activities, an e-card may be cancelled in order to prevent a person from using the e-card at the e-Gate for entry/exit.

f. Identification

Identification module helps in recognizing an e-card holder by his/her fingerprint. When the person places his/her finger on the scanner, the system automatically captures the fingerprint and verifies the person in the system. The applicant information, enrolled finger information (Left/Right hand & finger) and information about e-Gate Exit/Entry access status (Allowed/Not allowed with reason) will be displayed if the fingerprint is identified.

g. e-Gate access

e-Gate access module permits the person to access the e-Gate using their valid e-card. System captures e-card presence and authenticates the card status, identifies the person by their fingerprint, authenticates the person information against immigration business rules and updates the travel status on success. On failure, the system sends the message to the monitoring application.

e-Gate access module executes the following functions:
➢ Read proximity card and verify card.
➢ Scan fingerprint.
➢ Apply business rules.
➢ Update travel information.
➢ Write transaction log.
➢ Monitor e-Gate through sensor.

h. e-Gate monitoring

e-Gate monitoring application monitors and displays passenger information, photograph and the e-Gate activities through message queue. Monitoring application is running in a non-blocking mode and it will not affect the e-Gate performance. The following are the e-Gate access modules events:

➢ Valid proximity card holder but not having a valid fingerprint.
➢ Illegal e-Gate access and trying to access fingerprint.
➢ Invalid fingerprint.
➢ Failed to meet immigration business rules.
➢ Successful e-Gate access.

i. Stock and inventory module

Stock module keeps the card stock and handles the card circulation to various locations. The following sub-functions are supported in this module:

➢ Stock transfer to location.
➢ Stock distribution to user.
➢ Manage user stock.
➢ Stock ledger.

j. Transaction and log monitoring

Transaction and Log monitoring module maintains track of the complete transaction and logs into a central location. This application helps to produce a variety of reports (Enrolment, e-Gate Access, Monitoring, Identification, Business rule validation etc.) based on the logged information.

k. Remote registration

The remote registration application allows remote registration via the Internet. Based on the line bandwidth, the image can be handled online or offline. In the case of offline management, the system has to be reconnected later to the host network for image synchronization. This module is useful when the registration procedure requires to be completed outside the host network.

l. Notification service

The system transmits notification messages to the concerned person if there is a failure in any area of the system. Notifications are sent via email and are based on pre-assigned parameters.

m. Online transaction monitoring service

This module allows the online monitoring of each e-Gate and its passenger access from a remote location.

n. Reports

The system produces various MIS reports such as list of passenger entry and exit, list of registration, transaction log, notification log, summary reports, daily reports, exceptional reports and other reports.

9. First phase

The United Arab Emirates ranks the third in the world and first in the Middle East to implement the Unified e-Gates system, which was set up in mid-2002 at Dubai International Airports as a first phase. It proved very successful and offered excellent services to travellers, with formalities such as passport control and security checks being completed within no more than 5 seconds.

10. The project positions Emirates on Top Worldwide

After the execution of the Honourable Interior Minister's decision to implement the system at international airports, the Emirates become the first country in the world to set up the Unified e-Gates System at all airports. The decision to setup the electronic unifying system at all airports is in the line with the vision of the emirates, designed to usher dramatic change in the nature of the government services and giving the Emirates the opportunity to be the first country in the world to issue electronic cards to its local and foreign citizens.

11. e-Gate location and e-card issuance statistics from 01/01/2007 to 31/12/2007

Location	Transaction type	No. of cards
AUH – Airport Terminal one	Issue	4,176
	Renew	1,029
	Re-Issue	53
	Total	**5,258**
Abu Dhabi immigration	Issue	7,284
	Renew	129
	Re-Issue	26
	Total	**7,439**
Al Ain airport	Issue	103
	Renew	3
	Total	**107**
Al Ain immigration	Issue	1,205
	Renew	6
	Re-Issue	2
	Total	**1,213**
Sharjah immigration	Issue	6
	Total	**6**
Sharjah airport	Issue	15
	Renew	1
	Re-Issue	1
	Total	**17**

Grand Total	14,040

e-Gate location and e-card issuance statistics from 01/01/2007 to 31/12/2007
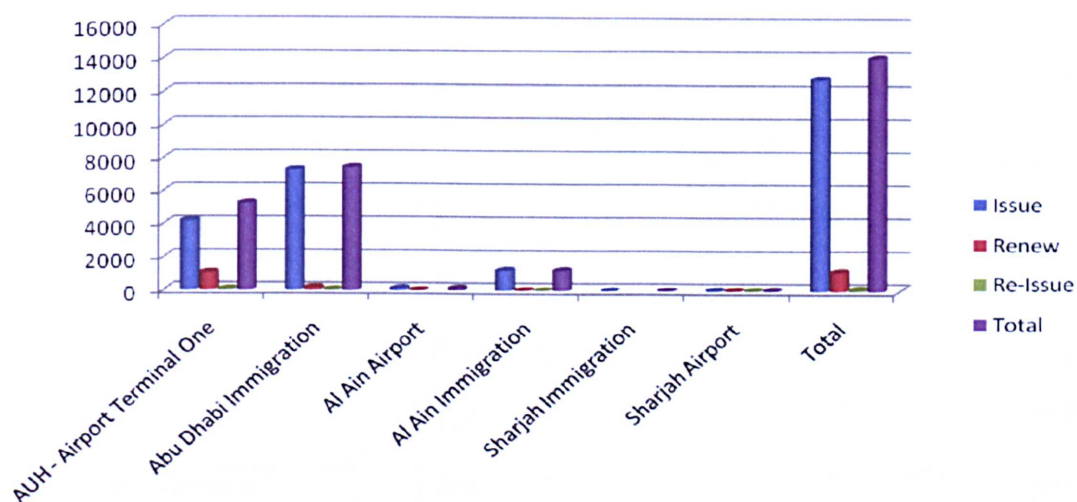
12. e-Gate location and e-card issuance statistics from 01/01/2008 to 15/10/2008

Location	Transaction type	No. of cards
AUH – Airport Terminal one	Issue	3,596
	Renew	2,033
	Re-Issue	57
	Total	**5,686**
Abu Dhabi immigration	Issue	4,430
	Renew	348
	Re-Issue	32

	Total	**4,810**
Al Ain airport	Issue	345
	Renew	16
	Re-Issue	4
	Total	**365**
Al Ain immigration	Issue	2,027
	Renew	23
	Re-Issue	12
	Total	**2,062**
Sharjah immigration	Issue	6,066
	Renew	203
	Re-Issue	16
	Total	**6,285**
Sharjah airport	Issue	1,979
	Renew	144
	Re-Issue	4
	Total	2,127
Ajman immigration	Issue	1,971
	Renew	163
	Re-Issue	5
	Total	**2,139**
Umm Al Quwain (UAQ) immigration	Issue	132
	Renew	12
	Total	**144**
Ras Al Khaima (RAK) Airport	Issue	22
	Renew	3
	Total	**25**

Ras Al Khaima (RAK) immigration	Issue	787
	Renew	26
	Re-Issue	1
	Total	**814**
Fujairah immigration	Issue	495
	Renew	36
	Re-Issue	3
	Total	**534**
Fujairah Airport	Issue	247
	Renew	6
	Total	**253**
Al Ain 2008 Aerobatic show	Issue	7
	Total	**7**
Abu Dhabi Chamber of Commerce	Issue	421
	Renew	93
	Total	**514**

13. e-Gate access statistics from 01/01/2007 to 31/12/2007

Location	Access type	No. of passengers
Al Ain	Arrival	43
	Departure	17
	Total	**60**
Abu Dhabi terminal 1	Arrival	48,951
	Departure	45,725
	Total	**94,676**

Abu Dhabi terminal 2	Arrival	879
	Departure	1,127
	Total	2,006
Sharjah	Departure	6
	Total	6

Arrival Total	49,873
Departure Total	46,875
Grand Total	96,748

e-Gate access statistics
from 01/01/2007 to 31/12/2007
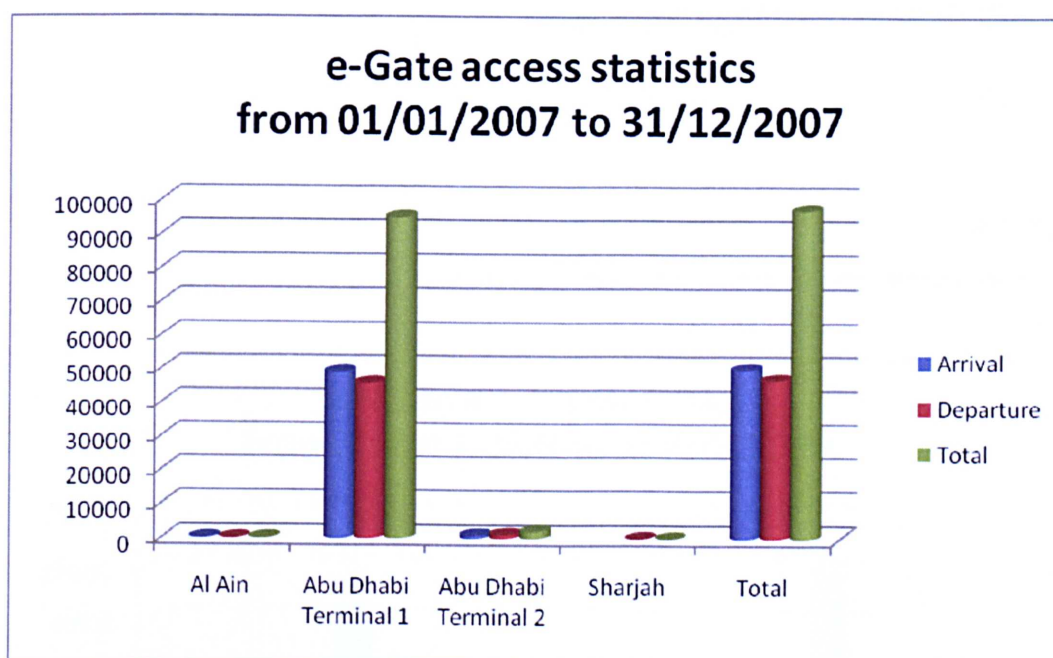
14. e-Gate access statistics from 01/01/2008 to 15/10/2008

Location	Access type	No. of passengers
Al Ain	Arrival	55
	Departure	178
	Total	233

Abu Dhabi terminal 1	Arrival		55,634
	Departure		28,577
		Total	**84,211**
Abu Dhabi terminal 2	Arrival		459
	Departure		4457
		Total	**4,916**
Sharjah	Departure		11,927
		Total	**11,927**
Ras Al Khaimah	Departures		2
		Total	**2**

Arrival Total	**56,148**
Departure Total	**45,141**
Grand Total	**101,289**

e-Gate access statistics from 01/01/2008 to 15/10/2008
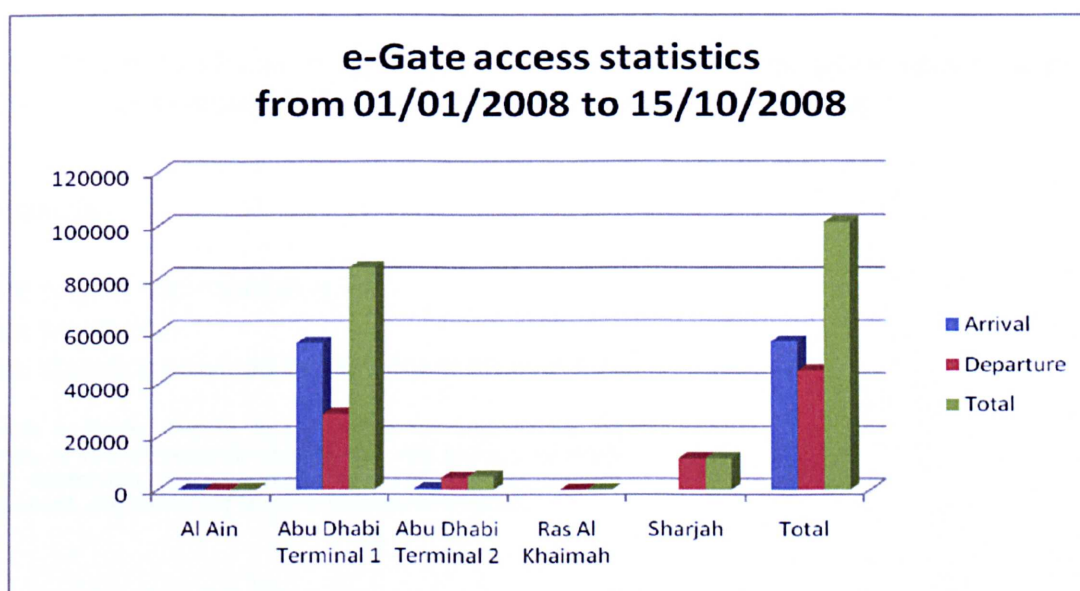
15. Future Plans and expansions

With amazing results in the e-Gate project, the government is currently studying the possibilities for its expansions. Following are the future plans for the expansion of this electronic gate service.

- Deploy on all the country sea and land ports.
- Current e-Gate card will be replaced by National I.D. Card for accessing the e-Gate.
- Incorporation of 3D barcodes at the time of enrolling.
- Notification service via SMS.
- Renewal of e-Gate service via Internet through the WEB site.
- Implementation of more e-Gates to reduced the number of immigration counters.

16. Conclusion

Technology is growing very fast especially in terms of security and e-services. All over the world governments are now providing e-services as much as possible to facilitate the citizen and residents of their countries keeping the security requirements intact. The rapid growing changes in the international securities and reflects the need for constant modernization. UAE has started the project for the Unified e-Gate system which has been implemented at all international airports of the country. This e-service is part of UAE e-government program.

The e-Gate service shall not nullify any existing security measures but somewhat simplify them to achieve the goal of smooth processing of passengers' movements and events in order to comply with the modern criteria of advanced technologies.

Acknowledgements

References

e-Gate project documentation.
e-Gate brochure.
e-Gate statistics provided by Ministry of Interior, UAE.

He holds a Master Degree in IT, and is currently doing his doctorate in eGovernment in London, UK. His primary interests include leadership and innovation in public sector, change management, and advanced technology experimentation.

Appendix 5

The use of biometrics for Disaster Victim Identification

Ahmed Alraisi

Introduction

In the aftermath of a disaster, there may be many victims, deceased or unconscious, whose identity is unknown. Sometimes, the bodies of the deceased may not be intact and the body parts for multiple people may be mixed. One responsibility of the Emergency Services managing the disaster is the identification of these people. This is referred to as Disaster Victim Identification (DVI). In order to establish the identity of an unconscious or deceased person an investigation needs to be conducted for each person. For disaster situations, person identification investigations are conducted in two areas...

a) Victims of the disaster in/around the disaster area
b) Missing people who could be victims in the disaster (people reported to be missing, travel manifest etc.)

The purpose is to match the victims with those missing, bearing in mind that not all victims will be reported as missing and there may be people who are reported as missing who are not involved in the disaster.

This investigation will involve many factors, with a variety of contributing identification evidence. This evidence can be categorised as a Primary or Secondary means of identification (INTERPOL DVI guide: 2009). Primary evidence is strong enough to positively identify a person, whilst Secondary evidence can only be used as supporting evidence for other methods.

a) Primary DVI evidence:
  a. Logistical evidence (who could have been in the disaster, missing persons, travel manifest etc.)
  b. Personal physical attributes
    i. DNA
    ii. Fingerprints, palm prints, footprints
    iii. Forensic Odontology (Dental, jaw characteristics)
b) Secondary DVI evidence:
  a. Personal description of the victim (gender, approximate age, height, ethnic affiliation, tattoos, moles, other distinguishing features)
  b. Personal belongings and clothes (ID documents, jewellery, phone, clothes etc.)

c. Photograph
d. Person or body parts positioning at the scene (allocated seats, proximity of personal belongings, proximity of body parts)
e. Visual identification (by relative etc.) (also potentially unreliable)
f. Medical history (Surgical implants, prosthetics, organ removal, scars, etc.)

All of this direct and indirect evidence must be systematically and rigorously collected, documented and managed; preferably employing a specialised Case Management System that assigns a unique case reference number for each missing person and unique evidence referencing for each item of evidence. Management of the disaster site is crucial to systematic victim evidence collection and victim identification. Inconsistencies and contamination of the site could destroy vital information used to identify victims, as can mismanagement of the information collected. This paper examines the use of biometrics as a means of supporting the identification of victims.

Use of biometrics to support DVI
Post-Mortem evidence
In the context of DVI, biometrics can be defined as the use of physical characteristics or traits for the identification of human victims. For DVI, many biometrics are not useful because the victim is deceased or unconscious. Any that involve behaviour or active participation of the subject are not viable (voice recognition, signature, walking characteristics etc.). Other biometrics may only be suitable for live or very recently deceased people like iris recognition or retina recognition, because some organs, like the eye, degrade very quickly after death. Biometric samples taken from the Disaster site can be referred to as Post Mortem (PM) samples.

Anti-Mortem evidence
Use of biometric identification evidence from a disaster scene is only useful if a corresponding reference biometric is available for the person. This includes reference samples taken directly from the victim prior to the disaster (e.g. samples provided for a biometric identity document) or may be taken indirectly from the victim (e.g. DNA taken from the victim's home). These may be referred to as Anti Mortem (AM) biometrics. Indirect AM biometric information must always have strong qualifying evidence proving identity. The collection of AM evidence must also be managed in a rigorous and systematic manner – certainly as strongly as evidence taken at a crime scene. This evidence must be uniquely referenced, fully documented and included in the Case Management system.

Suitable biometric candidates for DVI
As mentioned, biometrics that require active participation by the victim (Voice, walk, signature etc.) are generally unsuitable for use in DVI and will not be considered here, though in extreme cases one could imagine weak secondary evidence based on behavioural characteristics (for example identifying a leg injury in a victim and recognising a limp in Anti Mortem CCTV evidence of a missing person).

DNA

For many reasons, DNA biometrics, in the context of DVI, is the most compelling means of identification. However, DNA processing requires facilities and resources that may not be available to the DVI team. DNA matching is a primary DVI biometric because of…
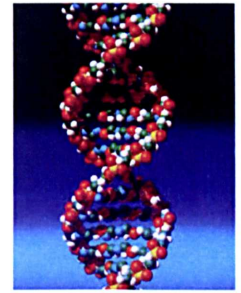
a) **Prevalence** - DNA exists throughout the body and body parts – all body components contain DNA

b) **Robustness** – DNA is protected inside the most resilient parts of the body particularly bones and teeth and can survive extreme environmental conditions like shock and heat.

c) **Longevity** – DNA can be extracted from human remains no matter how old they are. DNA can be extracted from severely decomposed bodies.

d) **Categorisation** – through biochemical techniques and human interpretation, it is possible to very accurately characterise DNA. Apart from the biochemical and interpretation processes, matching identification can be done automatically.

e) **Accuracy** – matching PM DNA samples from good AM reference samples can give positive identification accuracies 'approaching' 100%, particularly as the AM data set size is limited.

f) **Reference availability** - AM samples are available if there is access to the victim's personal environment/possessions and they can be positively linked with the victim. It is also possible that AM DNA evidence may be available, for example in Police forensic DNA systems, Military DNA records or National DNA databases and if accessible, these make a good starting point for matching PM DNA samples.

g) **Familial reference** – DNA is the only biometric that can positively link relatives of the victim. The closer the familial link or reference samples from more family members, then the more positive the identification. Hence this is very useful when no AM DNA evidence is available for a victim. This feature of DNA matching is also useful for linking related disaster victims.

h) **Body parts** – DNA is the only biometric common to all body parts. This is the only means of primary evidence to link body parts separated in the disaster.

i) **Physical characteristics** – A persons DNA can be used (increasingly) towards identifying certain characteristics of a victim, even if there is no AM reference DNA available. (For example gender, ethnicity, eye colour, original hair colour etc.). These can be used to support basic information about a victim and narrow down the missing persons data set.
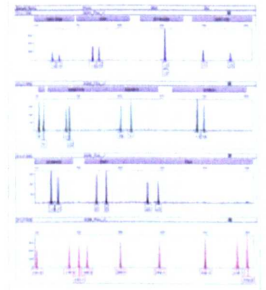
The only disadvantages of DNA can be summarised as…

a) **Time to process** – DNA biochemistry and interpretation takes time and, unlike many other biometrics, cannot be sampled and matched in real time. However, times for DNA processing are reducing with some portable kits able to produce a DNA profile within a relatively short period of time.

b) **Resource/cost** - DNA processing is very reliant on expensive critical scientific processes and expert human intervention. The resource and cost for DNA processing may not always be available to a DVI team.

c) **Reference availability** – Unlike some more popular biometrics, direct AM reference data for DNA is not as prevalent as some other biometrics (e.g. face, fingerprints etc.)

So if the resources for DNA processing are available; DNA is the most useful Primary biometric for DVI.

Fingerprints, palm prints, footprints ('dactyloscopic' prints)

Finger/palm/foot prints (Prints) are also a very useful primary means of biometric DVI because they share many of the characteristics of DNA in terms of accuracy but benefit from relatively low cost and simpler technology that allows for total matching automation and real-time results.

The main advantages of Finger/palm/foot prints are...

a) **Simple process** – The resources needed to process a print are relatively straight forward, low cost and quite common in most countries
b) **Categorisation** – though nowhere near as accurate as DNA matching, prints can be categorised very accurately with rates approaching 99.9%. This must be taken into account particularly when searching large databases (for example national fingerprint systems, where false matches are quite common). However if there is a separate database, limited just to persons missing in a disaster, then the accuracy increases considerably.
c) **Automation** – apart from sample collection, print matching can be achieved totally automatically – this makes the process more accessible to DVI teams
d) **Availability of AM print data** – fingerprint data is commonly available for many people. Fingerprints are used for many applications (for example Electronic passports and Identity cards, access control systems etc.) and may be available in police and military databases. If the databases hosting these applications are available, then they can also be searched for a victim's print match.

Disadvantages of print matching in a DVI context include...

a) **Availability** - Whilst fingerprints are unique, they can be permanently affected by injury and types of employment. Typical rates for failure to acquire an accurate fingerprint in a normal population can be as high as 1%.
b) **Robustness** - Prints are subject to degradation or destruction during a disaster. They can be severely affected by fire, for example and degrade as the body decomposes.
c) **Acquisition** – Acquisition of PM print data can be quite difficult from disaster victims. Body parts, particularly hands, arms, feet and legs are often displaced during the disaster. Acquisition requires well trained, skilled staff.

Prints generally and fingerprints specifically present a very useful and cost effective tool to the DVI team as a primary form of biometric identification.

Forensic Odontology (Dental/Jaw)

Teeth and jaw characteristics also present the DVI team with a useful means of identification. The teeth and jaw structures tend to be unique for most people, either naturally or because of orthodontic procedures, making them a primary biometric for DVI.

The features that make orthodontic comparison useful to the DVI team are…

a) **Unicity** – The teeth and jaw structures tend to be unique to one person and dental work (fillings, crowns, implants etc.) further enhances this unicity.
b) **Robustness** – Orthodontic biometrics involve the bodies most robust substances (teeth and bones) that are well protected during a disaster and usually remain intact.
c) **Accuracy** – An orthodontic expert (potentially with the help of computer analysis) is able to ascertain a match between two orthodontic images with quite high accuracy, particularly if the reference set is limited as in the case of a DVI AM evidence collection.
d) **Physical characteristics/lifestyle** – other basic features can be extracted from orthodontic images that may indicate physical characteristics and lifestyle trends of the victim. For example approximate age, ethnicity, diet. These can be used as weaker secondary evidence to restrict the search against AM datasets.

There are some disadvantages and restrictions on the use of orthodontic evidence…

a) **Availability of AM reference samples** – Usually only available in hospitals and dental clinics, orthodontic records are quite hard to collect. These would normally be acquired manually in the course of the investigation into known missing persons. No large scale databases are available.
b) **PM sample acquisition** – producing orthodontic scans of disaster victims involves skilled staff and expensive technology (for example specialist X-ray machines) – these may not be available to the DVI team
c) **Automation** – though some research has been carried out into the automation of orthodontic matching, with some success, automated orthodontic matching systems are not generally available to the DVI team. This lack of automation makes matching PM against AM orthodontic records very time consuming.
d) **Resources** – Orthodontic matching requires very skilled practitioners and expensive sensitive scanning equipment. These may not always be available to the DVI team.

Though somewhat expensive and slow, orthodontic matching can make a useful secondary biometric for DVI, particularly if there is no primary AM data available.

Medical history

Though not strictly a biometric, medical implants may be useful in identifying a victim. Many implants are customised for the recipient and many have unique reference numbers that can often be traced through hospitals and manufacturers. Of course all obvious medical history can help in supporting the basic information about a victim and can be used to filter or focus the search of AM data sets. This makes medical history a useful secondary means of identification for DVI.

Photograph/facial image

Identification of a victim from a photograph, by a friend or relative, is surprisingly unreliable for DVI. Often the victim is physically disfigured and the relative or friend may be in a stressed state. From that perspective, visual identification from a photograph is considered as secondary evidence. However, if the facial highlights of the victim are intact, automated face recognition could be considered. Face recognition works by characterising the facial geometry of the subject, usually starting with the position of the eyes and if that geometry is maintained, face recognition can be quite accurate.

Advantages of Face Recognition for DVI...

a) **AM data reference samples** – Facial images are ubiquitous and the most widely used and accepted biometric, even for people to recognise each other. They feature in almost every part of daily life and usually feature in almost all large scale databases involving personal records. (For example National Identity cards, immigration systems, electronic passports, criminal records, military records etc.)

b) **Sample acquisition** – acquiring a facial image is simple and the equipment is inexpensive and commonly available (camera).

c) **Automation** – facial matching is one of the most commonly applied automated biometric techniques. Large data sets can be searched very quickly with relatively standard IT equipment.

d) **Accuracy** – whilst nowhere near as accurate as DNA or fingerprint matching, automated facial matching can achieve acceptable accuracy against large data sets (for example driving licence image databases) and very high accuracy against limited data sets (for example missing persons list).

Disadvantages of Facial recognition for DVI...

a) **Longevity** - Facial geometry changes over time and with age. The greater the time between sample reference and subject facial image, the lower the accuracy

b) **Robustness** – it is common for facial disfiguration to occur in a disaster. This will lower the accuracy considerably. Also, automated facial recognition becomes impossible as a body decomposes.

Eye based biometrics (Iris, Retina)

Neither iris nor retina recognition are particularly useful biometrics for DVI because...

a) The structures of the eye degrade quickly after death

b) The pupil effectively dilates after death, rendering iris imaging impractical

However, it is technically possible to acquire an iris image from an unconscious person, though this is usually not practical. For these reasons, iris and retina biometrics are not usually considered for DVI.

Summary

A well prepared plan and process is essential for effective DVI. This plan would cover everything from disaster scene management, evidence collection and the entire investigation process. Technology will play an important role, particularly the inclusion of well-conceived case management facilities. Because of the importance of biographical and biometric evidence, then it is important that the case manages system can manage all AM and PM evidence, including biometrics, even if it relies on external systems for matching. Part of the DVI plan should include consideration of any large scale biometric databases that could be prepared for DVI.

Without doubt, biometric technology is central to the identification process in the aftermath of a disaster and should be prominent in any DVI planning process.

Appendix 6

Casualty Bureau Project

Update Report

Ahmed Al Raisi

Contents

1. Introduction

This report is submitted as a follow up document to an initial update report of the progress of the Casualty Bureau project, submitted on 17th December 2008.

This report is designed to reiterate the actions required to be reviewed in order to allow the Casualty Bureau project to continue and also to provide an update specifically in relation to the situation regarding the technology for and the location of the Casualty Bureau.

The actions are summarised at the end of the report and split into two areas:-

- Actions requiring decisions to progress the Casualty Bureau
- Actions requiring decisions to progress all elements of the Disaster Victim Identification process, of which Casualty Bureau is a small part and requires in place to function effectively.

Advice is given drawing on international best practices, Interpol guidance and lessons learnt from the United Kingdom through numerous incidents they have dealt with.

This report is submitted for your information and consideration.

2. Definition of a Casualty Bureau

It is essential that there is a definition of the role and expectations of the Casualty Bureau along with clear guidance on who can declare that a Casualty Bureau will be activated.

Please find below a recommended definition:-

The Casualty Bureau is the initial single point of contact for receiving and assessing information about people believed to be involved in a major disaster occurring within the Emirate of Abu Dhabi.

A Casualty Bureau will be activated as a result of a disaster involving mass casualties. The decision to activate a Casualty Bureau will lie with the duty Gold Commander or when requested by a higher authority.

The Casualty Bureau's primary aims are to:-

1. Obtain relevant information on the persons involved or potentially involved
2. To process that information and Reconcile missing person (Misper) records with Casualty, Survivor and Evacuee records;
3. To provide accurate information to relatives and friends, to the Senior Investigating Officer and Chief Medical examiner

This will be done by:-

1. Receiving enquiries from the general public and recording 'missing persons' reports
2. Recording details of survivors, evacuees, the injured and deceased including their whereabouts
3. Formulating a comprehensive list of missing persons
4. Collating data to assist in the identification of all persons involved

5. Liaising with the ante mortem team
6. Informing enquirers (by the most appropriate method) of the condition and location of these persons (General Message Unit)
7. The Bureau will also pass updated information to the Senior Identification Manager and Silver Command.
8. Provide information for the investigation process relating to an incident

To achieve these aims the Casualty Bureau has four core units that perform standard procedures:-

1. Incident Contact Centre is responsible for call handling and missing persons record management
2. Casualty Information Unit is responsible for record management of people reported as a Casualty, Survivor or Evacuee, and information received from the documentation teams
3. Nominal Matching Unit is responsible for matching data from the Incident Contact Centre and Casualty Information Unit and raising Actions for identification purposes;
4. General Message Unit is responsible for managing Actions and public reassurance.

Facilities for these cores Casualty Bureau functions will be at **(yet to be agreed).** The facilities are designated so are used for other purposes but will be vacated and equipped accordingly once authority to activate a Casualty Bureau is received.
Actions Required

1. Agree the definition of the Casualty Bureau. This will form the initial part of the Casualty Bureau Procedures Manual that will be produced and form the basis of how the Casualty bureau will be set up and function.

2. Define who can authorise the activation of a Casualty Bureau, possibly by name as opposed to rank.

3. Agree the location of the Casualty Bureau.

2.1 Structure of a Casualty Bureau

The Casualty Bureau will only be activated when an incident occurs, involving mass fatalities and authorisation is given to activate. Staff will then be called in from the list of volunteers we will have, therefore there are two structures to the Casualty Bureau one for times when the Casualty bureau is not activated and one for when it is.

It is important to recognise the difference between these two structures in that one is proactive in ensuring international best practises are maintained, planning and carrying out a training schedule and ensuing records of volunteers are up to date. The second structure reactive as it will be in response to a live activation so therefore needs to be different.

2.1.1 Proactive Casualty Bureau Structure

```
                    ┌─────────────────────────┐
                    │ Casualty Bureau Manager │
                    └─────────────────────────┘
              ↙              ↓               ↘
┌──────────────────┐  ┌────────────────┐  ┌──────────────────────┐
│ 1 Logistics Officer │  │ 4 Casualty Bureau │  │ 2 Administration staff │
└──────────────────┘  │ Trainers – 2 Initially with │  └──────────────────────┘
                      │ 2 more at a later date │
                      └────────────────┘
```

2.1.2 Reactive Casualty Bureau Structure

```
                    ┌──────────────────────────────┐
                    │ Senior Identification Manager │
                    └──────────────────────────────┘
                              │        Delegating Responsibility to
                              ↓        the Casualty bureau Manager
                    ┌────────────────────────┐
                    │ Casualty Bureau Manager │
                    └────────────────────────┘
              ↙                  ↓                  ↘
┌──────────────────┐                    ┌──────────────────┐
│ Deputy CB Manager │                    │ Logistics Officer │
└──────────────────┘                    └──────────────────┘
                              │
     ┌────────────┬──────────┼──────────┬────────────┐
     ↓            ↓                      ↓            ↓
┌─────────────┐ ┌─────────────┐ ┌──────────────┐ ┌──────────────┐
│ Incident Contact │ │ Casualty Information │ │ Nominal Matching │ │ General Message │
│ Centre Supervisor │ │ Unit Supervisor │ │ Unit Supervisor │ │ Unit Supervisor │
└─────────────┘ └─────────────┘ └──────────────┘ └──────────────┘
```
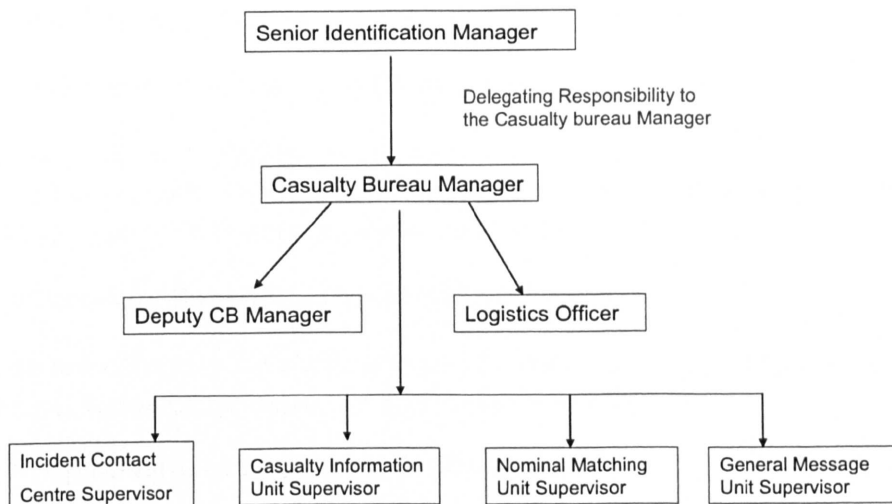
Operators required to work within the units

3. Casualty Bureau Forms/Documentation

Standard forms need to be used within the Casualty Bureau to record information.

The database used within the Casualty Bureau should reflect the agreed forms. The proposed forms to be implemented as the standard data recording documents within the Abu Dhabi Casualty Bureau (CB) are attached in both English and Arabic in *appendix A*

Some of the forms, for example the Casualty form will be used by other agencies such as hospitals to record information on behalf of Abu Dhabi Police who will then forward this to the Casualty Bureau for collation and processing.

The request also includes authorisation to have the forms on different coloured paper. Should there be a reason that the Casualty Bureau needs to run manually, it will assist in differentiating between the different forms to assist in the recording and matching of the data. The colours are also those used within the UK which may be taken on board as best practise in case there is a need for international assistance or working on an incident.

3.1 Missing Person Form (Misper) (White paper)

This form will be completed on behalf of anyone who is reporting someone they believe to be missing due to the incident.

3.1.1 Misper Cancellation Form (White Paper)

This form is to be used to cancel a person who has been reported missing. The criteria to cancel Mispers will be set by the Senior Identification Manager.

3.1.2 Casualty Form (Pink paper)

This form will be completed for anyone injured in the incident no matter how minor the injury. These should be available at hospitals for the Hospital Documentation teams to complete and at any facilities opened in relation to social care/rest centres.

3.1.3 Survivor/Evacuee Form (Blue paper)

This form will be completed for anyone who deems themselves to be a Survivor or Evacuee due to the incident. These people are likely to report themselves to hospitals or at any facilities opened in relation to social care/rest centres.

3.1.4 Personal Descriptive Form (White Paper)

These are completed in circumstances detailed by the SIM and can be completed alongside the other forms but primarily for Casualties and Mispers.

3.1.5 Involvement Details Form (White Paper)

Additional question to be asked as directed by the Senior Identification Manager.

3.1.6 Message Form (Green Paper) – only in English at present

To record messages from callers with information or offers of assistance.

Actions

1. Amend the Arabic versions as follows:-
   - Add the Abu Dhabi Police Crest to the top of each form
   - Remove the Government Protective Marking header from each page
   - Remove the Data Protection Warnings
   - Amend occurrences of 'surname' to 'family name' and insert additional spaces.
   - Add 'height' on the Casualty form
   - Amend the ethnic appearance from Arabic to Arab
   - Change the term HOLMES Ref Computer Ref

2. Approve the contents of the forms and arrange for them to be formatted correctly in a PDF format.

3. Approve the requested colour coding of the forms

4. At meeting on 06/01/2009 it was stated that the forms will be in English/Arabic i.e. one form with questions in both languages, this could change once a decision is made in relation to the language required for the technology

Once finalised and approved these forms will be part of the Casualty Bureau Procedures Manual.

4. Casualty Bureau Job Descriptions/Roles Profiles

Job Role	English	Arabic	Next Steps
Senior Identification Manager	Yes	Should have an Arabic version	To be agreed by General Director
Casualty Bureau Manager	Yes	Yes	As Above
Deputy Casualty Bureau Manager	Yes	Yes	As Above
Logistics Officer	Yes	Yes	As Above
Incident Contact Centre Supervisor	Yes	Yes	As Above
Incident Contact Centre Operator	Yes	Yes	As Above
Casualty Information Unit Supervisor	Yes	Yes	As Above
Casualty Information Unit Operator	Yes	Yes	As Above
Nominal Matching Unit Supervisor	Yes	Yes	As Above
Nominal Matching Unit Supervisor	Yes	Yes	As Above

General Message Unit Supervisor	Yes	Yes	As Above
General Message Unit Operator	Yes	Yes	As Above

General Information

The job descriptions are based on the UK Casualty Bureau roles but adapted to fit with the Abu Dhabi Police model. Copies of the job descriptions are attached in *Appendix B* in both English and Arabic.

The job descriptions will be used as the basis for recruitment and for developing training plans for each role. They will also form part of the Casualty Bureau Policy and Procedures Manual which will be published once the Casualty Bureau Business Process is agreed and available for activation.

Once agreed these job descriptions will form part of the Casualty Bureau Guidance Manual.

Actions

1. Agree the job role description required by Abu Dhabi Police for all Casualty Bureau functions.

5. Casualty Bureau Staffing Levels and Recruitment

A report was submitted on 6th October 2008 detailing the number of staff requested to be trained across the four rooms for the Abu Dhabi Police Casualty Bureau.

It includes details of the number of volunteer staff required of 245 along with consideration of a permanent team of 8 with initial staff levels comprising of a Casualty Bureau Manager, Logistics Officer 2 administration staff and 2 trainers with a further 2 trainers joining the team at a later date.

A copy of the report is attached in both English and Arabic in *Appendix C*.

The selection and recruitment should follow on from the agreement of the job roles as detailed in section three. Consideration should also be given to which security level staff working throughout the Casualty Bureau should be vetted to.

1. Agree the number of volunteer staff who can be trained across the Casualty Bureau Functions

2. Agree the number of permanent staff to be trained for specific job roles.

5.1 Recommendations for recruitment of staff for role of Senior Identification Manager
There is currently one Senior Identification Manager (SIM).

1. Further SIMS need to be identified and receive appropriate training within the UK. SIMs should be at least the rank of Major and recruitment to this role should take place between January and March 2009.

5.1.1 Recommendations for recruitment of staff for role of Casualty Bureau Manager and Deputy Casualty Bureau Manager

The officers selected for this role will be managing the Casualty Bureau on behalf of the Senior Identification Manager so require supervisory experience and a solid decision-making background.

1. Staff trained in these roles should be volunteers and of the rank of Captain or above

2. This phase should take place between January and March 2009.

Considerations for recruitment:-

- Staff from the force control room or other front line areas who will have a specific role should a major incident occur, should not be chosen for any of the Casualty Bureau roles as it is unlikely they will be released.

- Identified staff should compete a skills profile and/or be interviewed to assess their skills for the role

- Staff identified will be trained within the UK and Abu Dhabi with appropriate courses being identified following staff selection

5.1.2 Recommendations for recruitment of staff for Incident Contact Centre, Casualty Information Unit, Nominal Matching Unit and General Message Unit.

Staff trained within the Incident Contact Centre, Casualty information Unit or Nominal Matching Unit can be Policemen, police women, police officers or civilian police staff

1. Staff trained for work within the General Message Unit should have a Criminal Investigation Department background

2. Departments/sections are identified from which staff can be recruited to be trained in a Casualty Bureau role

3. Once these departments/sections are identified workshops should be held to explain what the roles entail.

4. This phase should take place between February and July 2009

Considerations for recruitment:-

- Staff from the force control room or other front line areas who will have a specific role should a major incident occur, should not be chosen for any of the Casualty Bureau roles as it is unlikely they will be released.

- Staff trained in any area of Casualty Bureau should be volunteers

- All staff who then volunteer should complete a skills profile and/or be interviewed.

- Consideration should be given to the appropriate security level staff working throughout the Casualty Bureau should be vetted to.

Points to note regarding the training

- Training will commence once the appropriate technology for the Casualty Bureau has been purchased, tested and installed within Abu Dhabi Police

- The training course time tables will be finalised once the technology for the Casualty Bureau has been purchased, tested and installed within Abu Dhabi Police. However initial training plans for each role are detailed in section 5, please note however these are draft plans only and training will not commence until early 2010.

1 All of these staff will be trained within Abu Dhabi, by the 4 staff identified as 'train the trainers' who will learn along side experienced staff. These 4 staff should be identified from all of those attending the workshops.

6. Casualty Bureau Location

A report has been submitted regarding the proposed location of the Casualty Bureaus four rooms, be in the training facilities area of Khalifa Park, a copy is attached in both English and Arabic in *Appendix D*.

However following our visit to the UK in November, it has been decided that to built a purpose Casualty Bureau facility. Plans have been drawn up for this but it is understood that it will take 15-18 months to build.

Although this may be the long term aim of Abu Dhabi Police a location for the interim period needs to be found. It is recommended that the option of the training facility at Khalifa Park is progressed with an agreement being made at General level that all the facilities will be made available should they be required for a Casualty Bureau.

There are issues with this in relation to how quickly we could activate and that technology may not be readily available, however a facility is required so for both live activation and training. Therefore agreements in relation to these issues will be required.

However following a conversation with officer on 26th January 2009 it appears that notice has been given to vacate Khalifa Park so is no longer a viable option. Therefore suitable short term accommodation should be sought but it must adhere to the policies set out in the Casualty Bureau Location report dated 21st September 2008 and attached in *Appendix D*.

Actions

1. Agree the Casualty Bureau location for the short term that adheres to the policies set out in the Casualty Bureau Location report dated 21st September 2008 and attached in *Appendix D*.

2. Work towards the long term aim of a purpose built Casualty Bureau Facility

7. Casualty Bureau Database and Telephony

On Monday 15th September 2008, along with officer, we attended a meeting with Director IT and Telecommunication Department. We discussed the database and telephony requirements for the Casualty Bureau. The report submitted following this meeting is attached.

A subsequent report was passed on 22nd January 2009 outlining some additional options.

7.1 Database

We have now completed a visit to the UK and spoken to two companies.

On Wednesday 3rd December 2008 we met with Unisys who owns the rights to the Home Officer Large Major Enquiry System (HOLMES 2) which is used within UK Police Forces.

They undertook a presentation of both the Casualty Bureau and Major Incident Room functionality of HOLMES 2 and Casweb.

It is to be noted that you cannot purchase one module without the other so if we take HOLMES 2 it will be the Casualty Bureau as well as Major Investigation Room modules.

Since writing the initial report in December 2008 Unisys has declined an invitation from Abu Dhabi Police to come over and give a presentation and meet representatives from the IT section.

We also attended the National HOLMES Seminar and spoke with a company called BOM Group. They have devised a Casualty Bureau system in the past that may be suitable for use within Abu Dhabi Police but to date the system has not been seen. A request to meet with them when we visit the UK in February 2009 to view the Casualty Bureau Exercise has been sent to them on 25th January 2009.

Actions

1. Make contact with BOM Group and arrange a meeting during our visit to the UK in February 2009.

2. Following visit to the UK, delegation to submit a report detailing the two systems viewed and how/if we should progress the purchase of one of the systems.

3. Formal decision made on the system required by Abu Dhabi Police for use within the Casualty Bureau

7.1.1 Telephony

We require a system that allows us to distribute calls evenly and throughout Abu Dhabi, possibly extending to other Emirates in the future. The system will need an option list for the callers at the initial contact stage so we can divert unnecessary calls such as wanting traffic information should there be a road closures due to the incident, the options should be similar to:-

- If you want to report someone missing press 1 - This will pass them to a call taker

- If you want to cancel a missing person as they have returned home press 2 – This will pass them to a call taker

However, we need to build in flexibility that will benefit us at a later date should we extend call taker assistance. This facility will then allow us to divert calls to different centres e.g. if people press 1 we can divert all calls to the Abu Dhabi Call Takers, if they press 2 we can divert the call to the Al Ain call takers (future considerations for call handling)

- If you required information regarding road closures please press 3 – This will take people to a voice recording giving details of who to contact.

All of these options should be set by the Casualty Bureau Manager prior to activation so they will need access to the appropriate part of the telephony system.

The system will also need to produce statistic so we can see how many calls are being received, answered or go unanswered so we can monitor staff levels accordingly. We will look to the lessons learnt in the UK which have been adopted as national best practise following major disasters and the response from the public.

From previous discussions It is understood that the current Abu Dhabi Police telephony system could be utilised for our Casualty Bureau needs.

Actions

1. A meeting with appropriate person in IT who can advise on our telephony requirements and if the current system can service this, if not what steps we need to take to implement the required system. This meeting should take place in January 2009.

8. Casualty Bureau is not a stand alone function

8.1 Executive Summary

Abu Dhabi Police is currently working on a two year project to implement a Casualty Bureau to the Emirate. During presentations regarding this project it has been emphasised that the Casualty Bureau cannot function effectively if a number of other elements are not in place and fully operational, these are grouped as follows:-

1. Senior Identification Manager
2. Forensic Responsibility
3. CID Responsibility
4. Documentation Teams
5. Reception Centres for Survivors/Evacuees and their families
6. Embassy Liaison
7. Media Responsibility

This report details what the Casualty Bureau will do and gives recommendations on how to move forward to ensure a streamlined and coordinated response to dealing with mass casualties and in realising the Casualty Bureau objective which incorporates all of these elements of disaster management. All of the elements together are referred to as the

Disaster Victim Identification (DVI) Process and a chart detailing this is shown in *Appendix E.*

All sections and recommendations are recognised as international best practice.

A visit to various UK police forces and attendance of the Casualty Bureau Senior Identification Managers course, to discuss and learn about some of the elements was undertaken in November/December 2008.

All the people we met reinforced the need for a co-ordinated response covering all of the areas mentioned to enable to Casualty Bureau to function and the police to provide a streamlined response to a mass fatalities disaster.

8.2 Casualty Bureau

Casualty Bureau is an information gathering function and is the initial single point of contact for receiving and assessing information about people believed to be involved in a major disaster occurring within the Emirate of Abu Dhabi.

A Casualty Bureau will only become active as a result of a disaster considered sizable enough to warrant a Casualty Bureau, ie a disaster involving mass casualties.

The Casualty Bureau's primary aims are to:-

1 Obtain relevant information on the persons involved or potentially involved

2 To process that information and reconcile missing person (Misper) records with Casualty, Survivor and Evacuee records;

3 To provide accurate information to relatives and friends, to the Senior Investigating Officer and Chief Medical examiner

To achieve these aims the Casualty Bureau has four core units that perform standard procedures:-

- **Incident Contact Centre** is responsible for call handling and missing person's record management.
- **Casualty Information Unit** is responsible for record management of people reported as a Casualty, Survivor or Evacuee, and information received from the hospital documentation teams
- **Nominal Matching Unit** is responsible for matching data from the Incident Contact Centre and Casualty Information Unit and raising Actions for identification purposes to be passed to the General Message Unit.

Please note that the three rooms listed above are information gathering rooms only, they will not be giving any information to members of the public.

- **General Message Unit** is responsible for visiting families of those believed to be involved in the incident following being given actions by the supervisor or Family Liaison coordinator. The staff within this unit should have a CID background and the unit is where the Family Liaison Co-ordinator will manage the Family Liaison Deployments. *When a positive identification is confirmed or further information required, this unit will give/receive the information from the families.*

The Casualty Bureau will fall under the overall responsibility of the Senior Identification Manager, however responsibility will be delegated to an appropriately trained Casualty Bureau Manager. Please refer to points 2 – 2.1.2 in relation to the Casualty Bureau structures.

All of the information gathered by the Casualty Bureau will be available for any investigation should the disaster be as a result of a criminal act.

8.3 Senior Identification Manager

The Senior Identification Manager (SIM) has many areas of overall responsibility including the Casualty Bureau, body recovery and hospital liaison. The SIM will need to make and record policy decisions in his own log on all of these areas following consultation with the appropriately trained staff that is delegated responsibility to run sections on the SIMs behalf.

Currently one SIM has been identified but there is a need for more as there needs to be sufficient to have a 24/7 availability list which will be available in the Operations Room detailing who is on call and also provide 24/7 cover should an incident occur.

1. Identify further members of staff at a minimum rank of Major to be trained as Senior Identification Managers – This is already identified as an action under the Casualty Bureau Staffing Levels and Recruitment section

8.4 Forensic Responsibilities

There are a number of areas that fall within the forensic remit and it is important that we have staff fully trained to carry out these roles within Abu Dhabi Police or have arrangements in place so we can call on assistance from outside agencies that specialise in areas of disaster management.

This section of the report and associated actions have been seen by staff at the Crime Scene Village, an initial and informal response has been received and we attach this as *Appendix F* for information only and covers actions 2-6 in this report.

The Disaster Victim Identification (DVI) guide referred to is an Interpol document and is attached in *Appendix G*. The United Arab Emirates is a member of Interpol so should follow this guidance and utilise the national DVI documentation.

8.4.1 Mortuary (section 4.4 of DVI guide)

There is a requirement for there to be a mortuary, including a body holding area and appropriately trained pathologists to carry out the post mortems and victim identification.

A report has been submitted to the Chief Medical Examiner in relation to this and is attached as *appendix H*.

Abu Dhabi Police should review the possibility of having their own facilities for this, however there is also an option to buy in this service from an outside company. One such company which is internationally recognised is Kenyon International http://www.kenyoninternational.com. They maintain fully equipped mobile mortuaries in Houston, Sydney and the United Kingdom, it may be advantageous to make contact with

them to discuss the possibility of them assisting Abu Dhabi in the event of a major disaster involving mass fatalities.

There will also need to be an agreement on what documentation will be used within the mortuary to record the information. As the United Arab Emirates are members of Interpol the standard Interpol Disaster Victim Identification (DVI) forms for both Ante and Post Mortem data gathering should be used. Copies of these forms were attached in English and Arabic in *appendix I*

8.4.1.2 Confirmation of Identity (sections 3 and 4 of DVI Guide)

When a forensic match is made, it is the Mortuary Manager's responsibility to inform the Senior Identification Manager (SIM). A policy needs to be agreed between Abu Dhabi Police and the Chief Medical Examiner on how this forensic match will be made and confirmation given of the victim's identity.

An option is to set up an Identification Commission or Board. The commission's ultimate responsibility is to make the final decision on the identification of each individual victim and should be composed of the most experienced identification experts.

Those sitting on the identification commission should be

Chief Medical Examiner
Senior Pathologist
Senior Identification Manager
Senior Investigating Officer (if one allocated)
Ante Mortem co-ordinator
Family Liaison Co-ordinator
Mortuary Documentation Officer
Representative from Ministry of Foreign Affairs

Once the victims identity has been confirmed by the Identification Commission, the Senior Identification Manager will ensure that both the Casualty Bureau and if activated the Major Investigation Room are informed of a forensic match. Once this information reaches the Casualty Bureau, the Nominal Matching Unit will search the Casualty Bureau database to see if the details of the Casualty match a missing person's record.

There is a centre based within the United Kingdom that can provide staff to carry out many forensic disciplines called Centre for International Forensic Assistance. Their website is www.cifa.ac.

8.4.1.3 Body Recovery Teams (section 4.3 of DVI guide)

There needs to be a team of staff who have received internationally recognised training in relation to body recovery. This will include how to record where the body/body part was found and how to transport this to the body holding area.

There should be standardised documentation to ensure all appropriate information is collated and passed onto the mortuary. A copy of the documentation used throughout UK Police forces is attached is attached in *Appendix J*.

8.4.1.4 Scene Evidence/Property Recovery Manager (section 4.3.5 of DVI guide)

It is important that any property or potential evidence is also collected from the scene and recorded in an appropriate manner with a recorded trail of continuity. There needs to be a number of staff trained in how to collect, collate and store the property and evidence recovered during an incident.

8.4.1.5 Religion and Culture (section 1.4 of DVI guide)

Throughout a major disaster the religious and cultural customs of the victims and families need to be considered and most noticeably within the area of body recovery and identification.

Work needs to be completed and a procedure agreed for dealing with the identification of victims giving consideration to their religious and cultural needs but also being aware of the legal process and responsibilities the country has in relation to victim identification.

2 Identify members of staff to be trained in body recovery, possibly the Rapid Reaction Team. Or initially look to having an agreement with an outside company who could send over appropriately trained staff when a disaster occurs.

3 Identify members of staff to be trained as Scene Evidence Recovery Managers to ensure that no evidence is lost for the investigative process.

4 Identify a site and build a mortuary to be used in the event of a major disaster involving mass fatalities or look to have an agreement with an external company who could provide the mortuary and equipment when a disaster occurs.

5 Agree policy in relation to victim identification, possibly through setting up an identification commission/committee.

6 Agree policy in relation to releasing a loved ones remains back to their family, including those who need to be repatriated taking into account the different religious and cultural aspects.

8.5 Criminal Investigation Department Responsibilities

The CID responsibilities come into effect at two levels, the first being if the disaster is due to natural causes, their input will be focusing on fulfilling the Family Liaison role. If the cause of the disaster requires investigating then the role will expand to cover the provision of a Senior Investigating Officer and the need for a fully operational investigation room.

The following section has been reviewed by CID Advisor, who agrees with the content and advises that plans have been drawn up to allow these areas to progress. However one key element to successful progression is that the proposed CID structural recommendations are accepted and implemented regarding SIOs, Family Liaison and Incident Rooms coupled with Serious Crime and Incident Response Teams with higher level Crime Scene capability ready to respond on a 24 hour basis.

8.5.1 Family Liaison Officers

Family liaison is a major part of the police response to a disaster and it's subsequent investigation. In addition to their role in the investigation, family liaison teams have a crucial role to play in the identification process. *Please note this role is different from the services provided by Social Support.*

The Senior Identification Manager has the responsibility to ensure that trained Family Liaison Officers are available and suitably deployed during a Casualty Bureau, however this responsibility will be delegated to a CID Officer who will be trained as family Liaison Coordinator.

It is essential that there is a team of staff who has been trained to internationally recognized standards available to carry out these roles. They also need an awareness of the different religious and cultural elements relating to the families they will be meeting with. The Family Liaison Co-coordinator will allocate a Family Liaison Officer to a family for the specific task of gathering material that will help lead to the identification of a suspected casualty. This includes obtaining their family history, recent activity, and ante mortem material such as DNA samples and/or medical and dental records for registering against the Misper or Casualty record by the Casualty Information Unit and matching by the Nominal Matching Unit. It is good practice to appoint, in the first instance, at least two dedicated Family Liaison Co-coordinators to the Casualty Bureau. This number can be increased or decreased according to the size and nature of the incident.

The Family Liaison Teams main Casualty Bureau tasks include:

- Collection of ante-mortem material and completion of an ante-mortem Interpol Form
- Informing the Next of Kin about the seriously injured or deceased.
- Investigation of the incident if relevant;

It is critical that family liaison activity is well coordinated, especially when the Senior Investigating Officer (SIO) requires one set of information and the SIM requires similar information but for a different purpose. The SIO and SIM must liaise with one another and fully brief the Family Liaison Teams *prior* to their deployment.

Please note a policy where by all Grade 1 missing persons families are allocated a single FLO who stays as their FLO throughout until the loved one is found or identified and returned to the family, should be considered. This is policy within the UK and is considered best practice.

8.5.1.2 Senior Investigating Officers

When the disaster is not as a result of natural causes, the act will need to be investigated. There is a need to have Officers trained to internationally recognised standards in relation to leading investigations and the role of a Senior Investigation Manager.

The Senior Investigating Officer will need to work closely with the Senior Identification Manager as they will both have requirements to enable them to carry out their role but they need to ensure that any decisions made, such as evidence recovery verses body recovery from the scene, will not have a detrimental effect on each others work.

All decisions, including the reasons, made by the Senior Investigating Officer should be recorded in a Policy Book.

8.5.1.3 Investigating the Incident

It is also important that there are suitable investigative administration processes in place to manage the criminal investigation. Having an incident room dedicated to this with appropriately trained staff will ensure that all of the paperwork is accurately registered, read to ensure all actions to assist with the investigation have been carried out and assist the Senior Investigating Officer by having the latest information immediately available and assist in the preparation of the file for the judicial process.

An investigation room with these principles is already in action in a limited format. This now needs to be built upon, implementing paper flow systems and using all information received in assisting the investigation.

8.5.1.4 Documentation Teams

Documentation teams are accountable to the Senior Identification Manager and deployed for two purposes:

- Identifying Survivors, Evacuees and Casualties involved in the incident;
- Collecting Missing persons, Survivor, Evacuee and Casualty data, and forensic evidence from those transferred to reception centers or receiving hospitals.

Depending on the nature and scale of an incident, documentation teams will be deployed to a range of designated locations. These include:

- The scene of the incident;
- Hospitals;
- Survivor/evacuee reception centers/Family and friends assistance centers/ Humanitarian assistance centers (these are referred to in greater detail in the next section of the document) – *These are explained in more detail later in the document.*

Where there is a delay in establishing reception centers, it is the Senior Identification Manager's responsibility to ensure that a temporary post-incident receiving site is set up without delay for the timely and accurate collection of data. This data is received by the Casualty Bureau for matching, actioning or canceling Missing persons records. Intelligence supporting an investigation may also be gathered. Casualties, Survivors and Evacuees may be able to provide crucial witness evidence relating to an incident.

Before deployment, however, the SIM will want to confirm with the designated receiving hospitals and reception centers that the capability and facility for the staff is in place and that there is a sufficient supply of standard Casualty forms.

Teams should comprise of one or a combination of the following staff:

- Supervisor;
- Liaison officer;
- Documentation officer(s);
- Exhibits officer(s).

As there are differences in the partners' procedures and protocols, there will be slight variations in how the teams inter-operate with key partners such as the hospitals. The main responsibility each team assumes is to collect relevant information from all those at the various designated locations.

A meeting was planned for Tuesday 11th November with managers from of the public and private hospitals in Abu Dhabi to advise of the function of the Casualty Bureau and the expectations placed on them but it did not take place.

7   Identify members of staff to be trained as Family Liaison Officers.

8   Identify members of staff at 1st Lieutenant rank to be trained as Family Liaison Coordinators.

9   Ensure all current and future trained Senior Investigating Officers are aware of Casualty Bureau and their responsibilities.

10 Identify an Officer to drive forward and enhance the current work to taking place in relation to Investigation Rooms to enhance the investigative administrative ability.

8.6 Reception Centres for survivors/evacuees and their families

It has been recognised through the many disasters that have occurred worldwide that as well as the responsibility for ensuring victims are correctly identified and treated with dignity there is also a responsibility to offer support to people who have survived and the families of all those involved in the disaster.

International best practices there are four different types of centre that can be opened depending on the needs of survivors and families. These centres are listed below with a definition of their role:-

8.6.1 Rest Centre

The aim of the Rest Centre is to provide immediate shelter for persons who have been evacuated from an area or are otherwise in need of emergency accommodation following an incident.

- To provide initial light refreshments for evacuees.
- To enable details of evacuees to be maintained in the centre for reference.
- To provide for the well being of the evacuees and to offer support services and information on a wide range of welfare related subjects.
- To provide a comprehensive system to advise evacuees and survivors on the progress of the emergency and its possible effects upon them directly.
- To provide evacuees with updated information about the incident.

They should provide

- Shelter
- Food & Drink
- Warmth
- First Aid
- Clothing
- Sanitation
- Information
- Advice

There are two different situations that could require the use of a Rest Centre. The first is during an incident where the Police implement an evacuation and require shelter for the

evacuees. The second is during an incident where the Police are not directly involved but there is still a need to provide a rest centre for the people affected, potential providers would be the Municipality, Education Ministry and Health Ministry.

8.6.1.2 Survivor Reception Centre

The aim of a Survivor Reception Centre is to provide a secure area set up in the immediate aftermath of an emergency where survivors not requiring acute hospital treatment can be taken for short-term shelter, first aid, interview and completion of documentation.

- To provide immediate shelter for persons who have been directly involved in an emergency.
- To allow documentation of the survivors.
- To enable the interviewing of potential witnesses by the Police.
- To provide first aid to those in need of it and not requiring hospitalisation.
- To provide initial care and welfare support to survivors.
- To organise onward travel where appropriate.
- To provide information to survivors.

A survivor reception centre is likely to have a far shorter operational time scale than a rest centre, usually not requiring the survivors to stay overnight. It is also very difficult to predetermine which premises to use as a survivor reception centre, since it will need to be established close to the incident site. This then creates problems in determining the set-up of the centre and therefore much of it will need to be done on an ad-hoc basis. The Police input into a survivor reception centre is far greater than their input into a rest centre

One of the purposes of establishing a survivor reception centre is to record survivors in order to eliminate them from missing person's enquiries made by worried relatives and friends. At a survivor reception centre facilities should be made for survivors to contact their family, friends and colleagues to let them know they are safe. This will alleviate undue distress and prevent unnecessary missing person's enquiries, thus aiding the Casualty Bureau process.

Another purpose of a survivor reception centre is to gather information from survivors who may be able to provide crucial information about what happened and may become witnesses at any subsequent trial or inquiry. There must be a balance between the requirement to gather evidence from survivors and the reluctance of some to remain at the scene of their distress.

8.6.1.3 Family & Friends Reception Centre

The Family and Friends Reception Centre should be located in a secure area set aside in the immediate aftermath of a disaster for use and interviewing of family and friends arriving at the scene or location of the incident such as an airport.

- To provide family and friends with a safe area to gather, away from media attention.
- A place where family and friends can be given up-to-date and accurate information on the rescue / recovery operation.
- A place where family and friends can be reunited with survivors.
- A place where police officers may need to take family and friends to a private area to be told their loved ones have died in the incident.
- To provide access to practical and emotional support to those affected.
- A place for the Police to record missing person's enquiries and to collect information that may aid their investigation.

It has been shown from experience that in the immediate aftermath of an incident, many people will travel to the scene in order to find family and friends that they believe to be involved. If large numbers of people are converging on the scene, the police may decide that it is necessary to have a separate area where Family and Friends can gather to receive information as it becomes available. A family and friends reception centre may be located near to the scene, in the area of the community affected or at the associated entry or departure points.

A Family and Friends Reception Centre is a safe place for family and friends to gather where they can receive up-to-date information about the situation and/or rescue operation. The Police are responsible for giving the fullest and most accurate information to family and friends, in as sensitive a way as possible. A family and friends centre is also a place where the police can gather information for the investigation and missing person's enquiries, which will greatly aid the matching of those involved to their families. A family and friends reception centre may also be used to reunite survivors with their relatives, or for the police to inform family and friends that their loved ones have died.

The following services should be provided within the Family and Friends Reception Centre:-

General Care

- Organise and arrange onward travel arrangements for family and friends; and provide transport to take evacuees / survivors to the centre if required.
- Request voluntary organisations services as necessary and co-ordinate their response.
- Co-ordinate aftercare, in conjunction with the Police, Health Authority and Voluntary Organisations.
- Consult and involve representatives of faith communities where appropriate.

Adult and Child Social Care

- Adult and/or Child Social Care may provide a liaison officer to assess the needs of the family and friends in the centre.
- Support existing 'clients' who may have family and friends involved in the incident.
- Assess and respond to the long-term social and psychological impact of the incident on family and friends, and the wider community.

Crisis Support Team

- Provide practical and emotional support to survivors affected by the incident.
- Provide specially trained volunteers to assist the Police in staffing the centre if requested.
- Liaise closely with Police Family Liaison Officers and Police Documentation Teams. Explain the procedures involved with recovery and identification of bodies.

Police

- Provide security for the premises.
- Record the details of the family and friends in the centre.
- Assist family and friends in filling out missing persons forms.
- Collect data that may assist the investigation process.
- Ensure all missing persons forms and information are passed to the Casualty Bureau.
- Provide a separate area for reuniting friends and family with survivors in privacy.

- Establish a reception desk near to the entrance of the centre to 'vet' those entering and leaving the centre.
- Provide up to date information about the rescue and recovery operation.

Health Ministry

- Provide care and advice to family and friends, including replacement medication.
- Administer medications, prophylactics, vaccines and counter measures as required.

Voluntary Sector

- Certain voluntary agencies may be able to provide specific services e.g. the Red Crescent may be able to provide first aid and other disaster related care. *The Red Crescent website does mention that they have a disaster management assistance capability.*

Due to the sensitive nature of the information being received and given at a family and friends reception centre, consideration should be given to the comfort and privacy of the individuals at the centre. Therefore the chosen location should be able to provide a large congregation area, separate private interview rooms and a refreshment area.

Depending on the nature of the incident there may be a need to provide family and friends with overnight accommodation. In this instance a hotel may be a more suitable venue for the centre. Consideration should be given to securing / obtaining sufficient hotel overnight accommodation for staff, family and friends.

8.6.1.4 Humanitarian Assistance Centre

The decision to open a Humanitarian Assistance Centre will be taken by the Strategic Co-ordinating Group (or Gold). However, it is important that a multi-agency group is established to plan for a Humanitarian Assistance Centre and to manage it if one needs to be opened. When a Humanitarian Assistance Centre is no longer required, ongoing support to the community will be provided by the Local Authority as part of the wider recovery process.

The aim of the Humanitarian Assistance Centre is to be a one-stop-shop for survivors, families, friends and all those impacted by a disaster, through which they can access support, care and advice. It shoud:-

- Act as a focal point for humanitarian assistance to bereaved individuals and families, survivors and impacted communities.
- Enable individuals and families to gain as much information as is currently available about family members and friends involved in the incident.
- Enable the gathering of mass forensic samples in a timely manner, in order to enhance the ability to identify loved ones quickly.
- Offer access to a range of facilities that will allow individuals, families and survivors to make informed choices according to their needs.
- Provide a coherent multi-agency approach to humanitarian assistance in emergencies that will minimise duplication.

The range of emotional and practical support available at the Centre should include:

- Welfare & Counselling
- Accommodation & Transport advice
- Benefits advice

- Legal & Insurance advice

Humanitarian Assistance Centres (HAC) will vary greatly depending on the incident, the needs of those affected and the stage of the response/recovery.

A more detailed description of these center's can be provided once an officer is identified to lead on this area of the project.

11 Identify an officer who can work on agreeing a memorandum of understanding in relation to which agencies, alongside the police will be responsible for opening and setting up rest and assistance centres for those involved in the incident and their families including foreign nationals.

8.7 Embassy Liaison

During any incident where foreign nationals may be involved will mean that Embassies will receive calls from concerned relatives and want information from the police about their nationals.

It is important that we liaise with the embassies and that there is an agreement in place on how information will be passed between Abu Dhabi Police and the Embassies. It is important that the families receive one message regarding their loved ones which should come from the police but the embassies also need to be informed so a streamlined and coordinated response is required to ensure accurate information is given in the first instance.

12 Identify an officer who can liaise with all Embassies and agree a memorandum of understanding on how Abu Dhabi Police and the embassies will share information during a major disaster.

8.8 Media

Gold has responsibility for the media strategy including the release of the dedicated telephone number allocated to the Incident Contact Centre section of the Casualty Bureau for members of the public to call to report people missing due being involved in the incident.

Media coverage has a significant influence on the effectiveness of a Casualty Bureau and the Senior identification Manager will want to be proactive in ensuring the needs of the Casualty Bureau are met by having an input into Gold's media strategy at the earliest possible opportunity. It must be recognized that all media releases are the responsibility of Gold Command not of the Senior Identification Manager (SIM) so a media liaison officer will need to be appointed.

There will also be a media presence at any rest/reception centers so plans should identify the need to be aware of the media annoyances. Media briefings should go through the normal emergency planning channels and the police should ensure that rest/reception centre is secure from the media's intrusion.

Some evacuees may be prepared to or want to give interviews to the media. Arrangements for allowing and facilitating this can be good public relations for the agencies involved in the emergency response.

In major incidents where there is intense press interest, the Senior Identification Manager will need to liaise regularly with the force media liaison department to ensure current, appropriate and timely dissemination of information at staff briefings.

13 Designate a number of staff from the media unit to be responsible for all media press releases on behalf of Gold Command, through which the Senior Identification Manager will put all press releases.

14 It is recommended that a committee is formed looking at all aspects of Mass Casualty Handling where key representatives from all of the detailed elements are present and take forward their individual areas of expertise.

9. Conclusion

All of the above elements are essential to a Casualty Bureau being effective and achieving its aims. Further details on all of these areas can be provided and the attached appendices expand on these points.

It is recommended that there is a committee formed looking at all aspects of Disaster Victim Identification where key representatives from all of the detailed elements are present and take forward their individual areas of expertise.

The committee will monitor progress of each individual work stream and ensure there is a co-ordinated and stream lined approach that culminates in all areas being fully functional on a time line parallel with the Casualty Bureau Implementation Project.

9.1 Next Steps

In tandem with this and specifically in relation to Casualty Bureau we need to also start looking at:-

- How we will manage calls from those who do not speak English or Arabic

- How we will liaise with the numerous embassies who will want information on their citizens

- How we will liaise with the hospital regarding casualties and housing the Hospital Documentation Teams

- How the welfare of the staff working throughout the Casualty Bureau will be managed through training, risk assessments and operational debriefs

- Research into the qualification requirements for Senior Identification Managers to attend the UK National SIMs course. Research is required as currently all SIMs need to be trained Senior Investigating Officers initially, so the training may not suit our needs.

10. Actions Summary – Actions for Casualty Bureau

Definition of a Casualty Bureau

1. Agree the definition of the Casualty Bureau. This will form the initial part of the Casualty Bureau Procedures Manual that will be produced and form the basis of how the Casualty bureau will be set up and function.

2. Define who can authorise the activation of a Casualty Bureau, possibly by name as opposed to rank.

3. Agree the location of the Casualty Bureau.

Casualty Bureau Forms/Documentation

4   Amend the Arabic versions as follows:-
   - Add the Abu Dhabi Police Crest to the top of each form
   - Remove the Government Protective Marking header from each page
   - Remove the Data Protection Warnings
   - Amend occurrences of 'surname' to 'family name' and insert additional spaces.
   - Add 'height' on the Casualty form
   - Amend the ethnic appearance from Arabic to Arab
   - Change the term HOLMES Ref Computer Ref

5   Approve the contents of the forms and arrange for them to be formatted correctly in a PDF format.

6   Approve the requested colour coding of the forms

7   At meeting on 06/01/2009 it was stated that the forms will be in English/Arabic ie one form with questions in both languages, this could change once a decision is made in relation to the language required for the technology

Casualty Bureau Job Descriptions/Roles Profiles

8   Agree the job role description required by Abu Dhabi Police for all Casualty Bureau functions.

Casualty Bureau Staffing Levels and Recruitment

9   Agree the number of volunteer staff who can be trained across the Casualty Bureau Functions

10 Agree the number of permanent staff to be trained for specific job roles.

Recommendations for recruitment of staff for role of Senior Identification Manager

11 Further SIMS need to be identified and receive appropriate training within the UK. SIMs should be at least the rank of Major and recruitment to this role should take place between January and March 2009.

Recommendations for recruitment of staff for role of Casualty Bureau Manager and Deputy Casualty Bureau Manager

The officers selected for this role will be managing the Casualty Bureau on behalf of the Senior Identification Manager so require supervisory experience and a solid decision-making background.

12 Staff trained in these roles should be volunteers and of the rank of Captain or above

13 This phase should take place between January and March 2009.

Considerations for recruitment:-

- Staff from the force control room or other front line areas who will have a specific role should a major incident occur, should not be chosen for any of the Casualty Bureau roles as it is unlikely they will be released.

- Identified staff should compete a skills profile and/or be interviewed to assess their skills for the role

- Staff identified will be trained within the UK and Abu Dhabi with appropriate courses being identified following staff selection

Recommendations for recruitment of staff for Incident Contact Centre, Casualty Information Unit, Nominal Matching Unit and General Message Unit.

14 Staff trained within the Incident Contact Centre, Casualty information Unit or Nominal Matching Unit can be Policemen, police women, police officers or civilian police staff

15 Staff trained for work within the General Message Unit should have a Criminal Investigation Department background

16 Departments/sections are identified from which staff can be recruited to be trained in a Casualty Bureau role

17 Once these departments/sections are identified workshops should be held to explain what the roles entail.

18 This phase should take place between February and July 2009

19 All of these staff will be trained within Abu Dhabi, by the 4 staff identified as 'train the trainers' who will learn along side experienced staff. These 4 staff should be identified from all of those attending the workshops.

Considerations for recruitment:-

- Staff from the force control room or other front line areas who will have a specific role should a major incident occur, should not be chosen for any of the Casualty Bureau roles as it is unlikely they will be released.

- Staff trained in any area of Casualty Bureau should be volunteers

- All staff who then volunteer should complete a skills profile and/or be interviewed.

- Consideration should be given to the appropriate security level staff working throughout the Casualty Bureau should be vetted to.

Casualty Bureau Location

20 Agree the Casualty Bureau location for the short term that adheres to the policies set out in the Casualty Bureau Location report dated 21st September 2008 and attached in *Appendix D*

21 Work towards the long term aim of a purpose built Casualty Bureau Facility

Casualty Bureau Database and Telephony

22 Make contact with BOM Group and arrange a meeting during our visit to the UK in February 2009.

23 Following visit to the UK, delegation to submit a report detailing the two systems viewed and how/if we should progress the purchase of one of the systems.

24 Formal decision made on the system required by Abu Dhabi Police for use within the Casualty Bureau

25 A meeting with appropriate person in IT who can advise on our telephony requirements and if the current system can service this, if not what steps we need to take to implement the required system. This meeting should take place in January 2009.

10.1 – Action summary for DVI Process, part of which is Casualty Bureau

Casualty Bureau is not a stand alone function

The below functions are to be developed by the Disaster Victim Identification Committee (subject to the recommendation being approved for such a committee)

There is an identified need to instruct a new committee specifically formed to develop all of the functions of Disaster Victim Identification.

26 It is recommended that a committee is formed with specific terms of reference to develop and implement a co-ordinated response within Abu Dhabi Police to Disaster Victim Identification to international standards.

Forensic Responsibilities

27 Identify members of staff to be trained in body recovery, possibly the Rapid Reaction Team. Or initially look to having an agreement with an outside company who could send over appropriately trained staff when a disaster occurs.

28 Identify members of staff to be trained as Scene Evidence Recovery Managers to ensure that no evidence is lost for the investigative process.

29 Identify a site and build a mortuary to be used in the event of a major disaster involving mass fatalities or look to have an agreement with an external company who could provide the mortuary and equipment when a disaster occurs.

30 Agree policy in relation to victim identification, possibly through setting up an identification commission/committee.

31 Agree policy in relation to releasing a loved ones remains back to their family, including those who need to be repatriated taking into account the different religious and cultural aspects.

Criminal Investigation Department Responsibilities

32 Identify members of staff to be trained as Family Liaison Officers.

33 Identify members of staff at 1st Lieutenant rank to be trained as Family Liaison Coordinators.

34 Ensure all current and future trained Senior Investigating Officers are aware of Casualty Bureau and their responsibilities.

35 Identify an Officer to drive forward and enhance the current work to taking place in relation to Investigation Rooms to enhance the investigative administrative capability.

Reception Centres for survivors/evacuees and their families

36 Identify an officer who can work on agreeing a memorandum of understanding in relation to which agencies, alongside the police will be responsible for opening and setting up rest and assistance centres for those involved in the incident and their families including foreign nationals.

Embassy Liaison

37 Identify an officer who can liaise with all Embassies and agree a memorandum of understanding on how Abu Dhabi Police and the embassies will share information during a major disaster.

UAE eBorders

Final System Architecture

December 2012
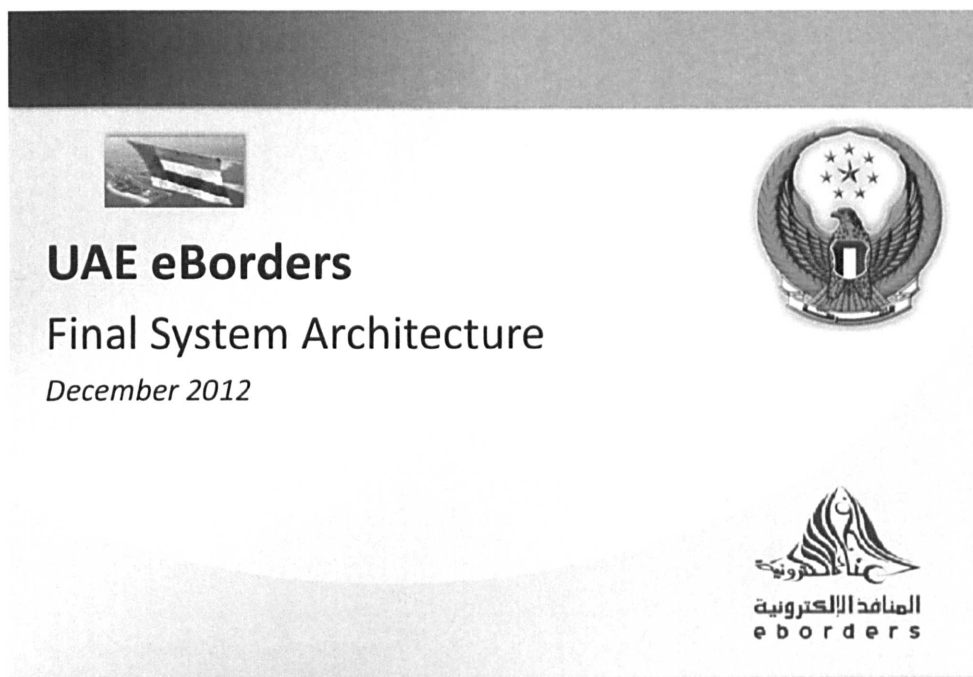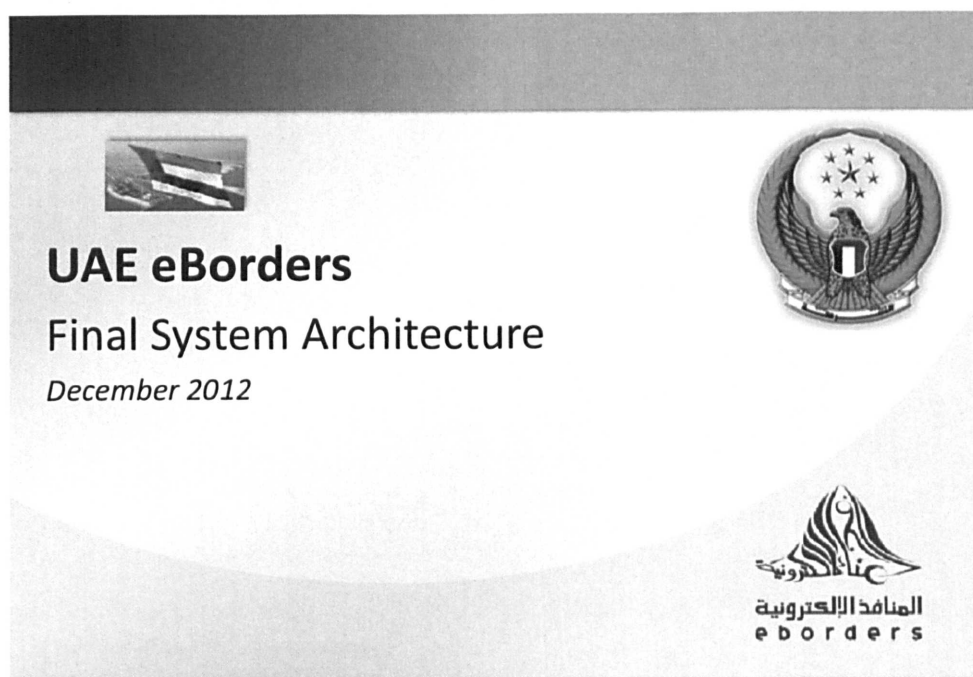
UAE eBorder - Final System Architecture

Pilot Architecture (Current)
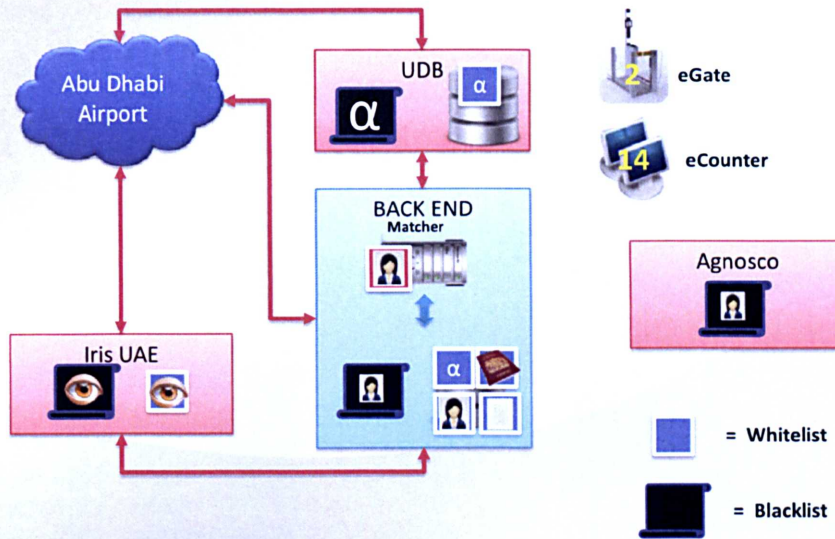
5   UAE eBorder - Final System Architecture

Production Architecture (Final)
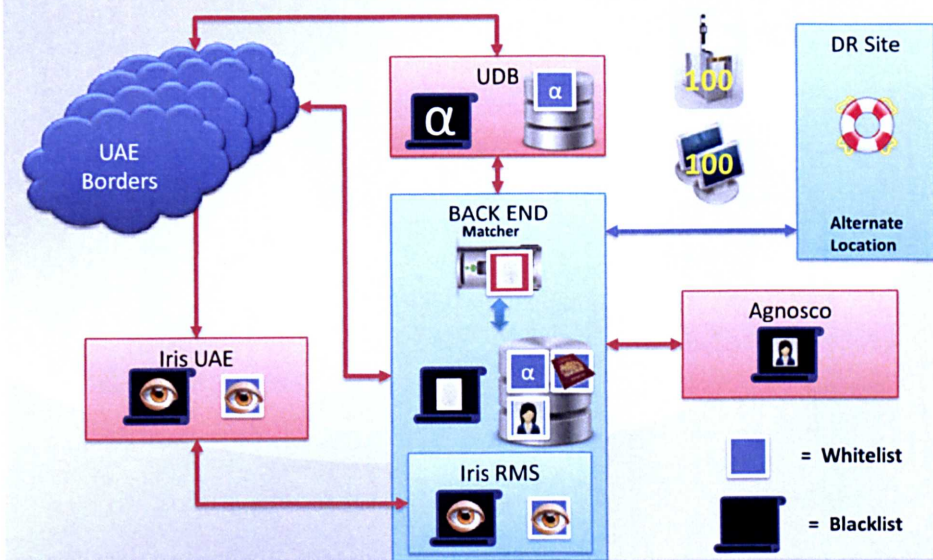
9   UAE eBorder - Final System Architecture

eGate

- Used by Nationals and Residents
- Can be used by visitors of the 32 Nationalities
- Requires registration and a fee
- Average passage time of 18s

Fast eCounter Process

ePassport / ID Card
Boarding-pass
Multi-reader (UV / IR)

UAE ID
card authentication

Iris + Face-at-Distance
Camera

- Nationals/residents only
- Emulate eGate at the counter
- Automatic registration for eGate usage
- One-time usage only
- Average transaction time < 30 sec

Multi-biometric
Workstation PC

1D and 2D
barcode
reader
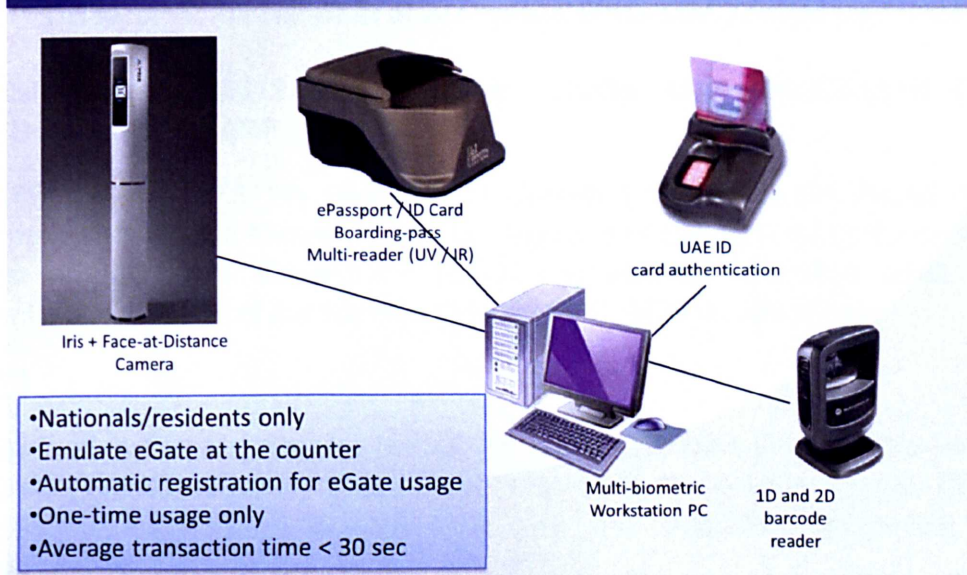
Media

38 Designate a number of staff from the media unit to be responsible for all media press releases on behalf of Gold Command, through which the Senior Identification Manager will put all press releases.

UAE eBorders

Appendix 8

**Contribution made to the proposal and creation of Crisis and
Disaster Administration at AD Police, GHQ, UAE, below are details**

**Ministerial Decree 28/2012 and its Major Articles which established Crisis and
Disaster Department at ADP**

On the 18th January 2012, His Highness Lt General Sheikh Saif Bin Zayed Al Nahyan, Deputy Prime Minister and Minster of Interior, signed a decree approving the introduction of the Crisis and Disasters Department (CDD) into Abu Dhabi Police GHQ. The new department was to be part of the General Directorate of Central Operations.

Article (1)

This recognized in law, the need to ensure the new department provides the best possible level of preparedness, response and recovery phases to any disaster by Abu Dhabi Police and the partner agencies. It also all other Law and supporting processes should be considered when enacting Ministerial Decree 28/2012.

The law set certain tasks in the Articles embodied within it.

Article (2)

Disengagement of the Victims Bureau from EPS Department to be attached to the Crises & Disasters Department.

A previous Ministerial Decree 589/2009 had put in place the creation of a Victims Bureau, the tasks were comply with international standards and INTERPOL Disaster Victim Identification guidelines for the management of mass casualty incidents. This Article

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removed the Bureau from the Emergency and Public safety department to the CCD so that all functions relating to Crisis Management was under one Department.
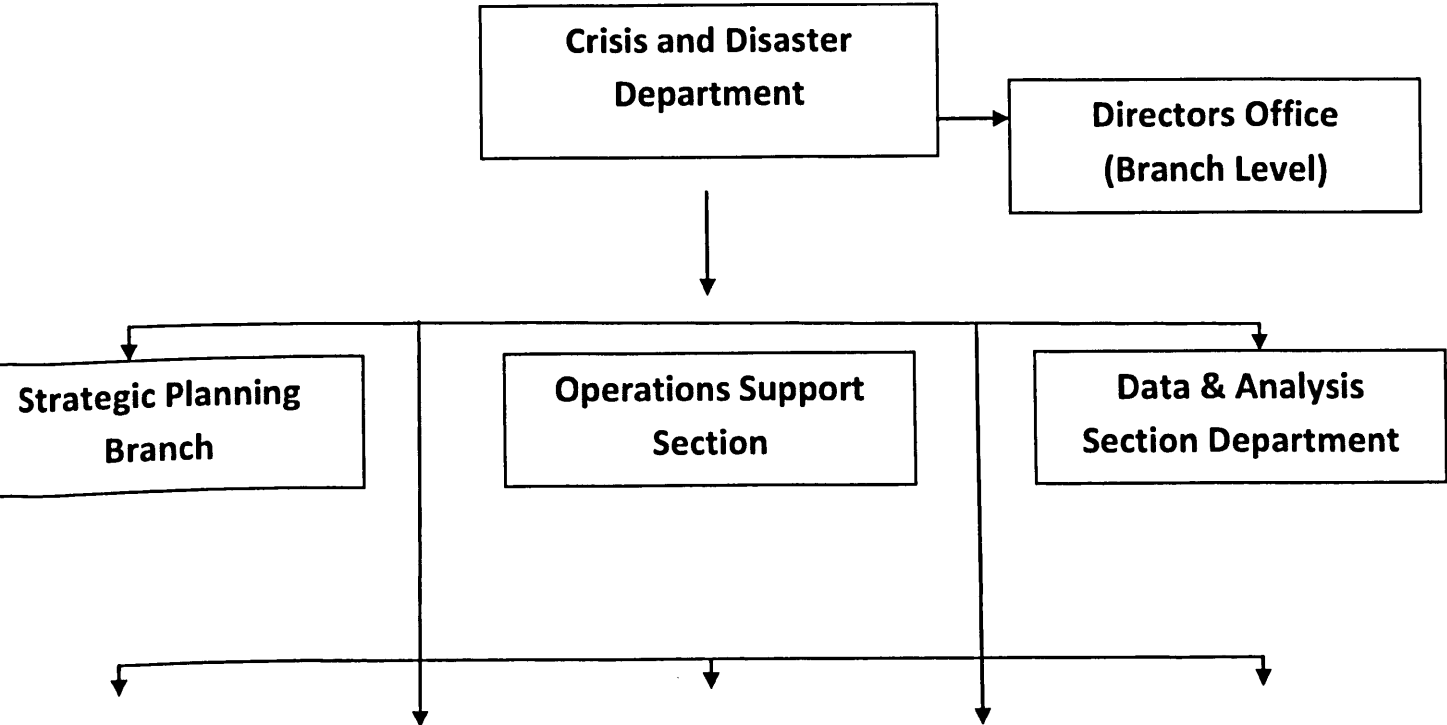
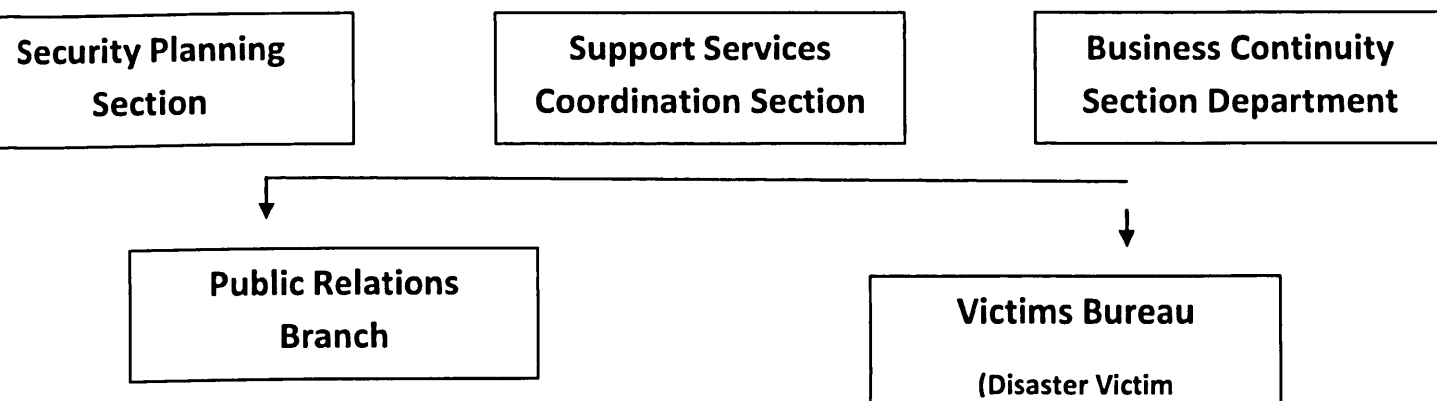The overarching role of the CCD is identified in **Article (3)** as it defined the tasks as:

(The tasks of the New Department listed below have been translated from Arabic text)

1. Lay down CDD plans, work programs and procedures according to the security strategies endorsed by Abu Dhabi Police GHQ and follow-up on the implementation of such plans in coordination with the concerned parties.
2. Draw special plans, programs and procedures with the participation of AD Police to respond to the major incidents and crises.
3. Coordinate and organize the roles and responsibilities of the police forces in the administration of crises, disasters, incidents and riots to maintain security, order and public safety.
4. Undertake early coordination with the relevant agencies concerned with response to crises and disasters, prepare emergency plans and alternative crisis response plans and provide the necessary support for the responding to crises and disasters.
5. Create an integrated database for keeping the operations plans and programs and keeping the statistical maps, diagrams and data.
6. Study and analyse the statistical indices of major security crises and incidents; determine the best methods to respond and alleviate their impact.
7. Develop business Continuity plans in coordination with the internal and external partners for the management of major crises and disasters, during and after crises.
8. Ensure continuous communication with the internal and external stakeholders to ensure their contribution to the process of updating the implementation plans and mechanisms.

In Article (4) the organizational structure of the new department was identified and is shown in Figure 1 below

Figure 1 Shows Structure of the Crisis and Disasters Department

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Security Planning Section	Support Services Coordination Section	Business Continuity Section Department

Public Relations Branch	Victims Bureau (Disaster Victim

Each of the subsequent Articles designates the roles and responsibility of each Section or Branch within the Department

Article (5) identified the tasks of the Security Planning Section as:

1. Coordinate with the concerned quarters at the CDD regarding preparation of the security plans, emergency plans and alternative plans in the light of the endorsed security and strategic policies.
2. Follow-up on the implementation of the security plans, operational plans and emergency plans to ensure effectiveness and response to the major incidents and crises.
3. Define the requirements for implementation of the operational and emergency plans; organize and distribute roles and responsibilities to the security and safety agencies.
4. Coordinate with the concerned quarters to prepare and perform exercises and security training scenarios, as well as observe performance to assess readiness to deal with major disasters and incidents.
5. Ensure continuous training of crisis teams (gold and silver commanders) to handle incidents and crises.
6. Study the problems and obstacles that hinder proper response to the major incidents and propose suitable solutions.
7. Organize meetings and coordination gatherings with the concerned CDD bodies to review the incidents that occur to derive lessons for future utilization.
8. Coordinate with the civilian agencies in the government and private sectors to prepare to work jointly, in the event of a crisis, respond and alleviate the impact of such crisis.

Article (7)

The Security Planning Section shall comprise the following branches:

1. Security Plans Branch
2. Training Branch
3. Evaluation and Benchmarking Branch
4. Partnership Coordination Branch

Article (8)

The Operations Support Section shall undertake the following tasks:

1. Coordinate the special procedures related to the logistical support, technical support as well as the other physical needs for other AD Police units which are concerned with responding to crises.
2. Coordinate and organize participation of the concerned departments to avoid overlap.
3. Organize gold and silver commanders' daily schedules and provide them with the information and data required for dealing with major incidents.
4. Study and determine the security needs required for handling major crises.
5. Develop standard operating procedures in coordination with the Operations Department to receive and dispatch vital information concerning the CDD, as well as anything related to coordination about deploying the mobile Operations room to the incident scene.
6. Prepare security reports about incident response procedures and point out the strengths and weaknesses to derive lesson for the future.

Article (9)

The Operations Support Section shall comprise the following branches:

1. Command Support Branch.
2. Crisis room Support Branch.
3. Mobile Command Support Branch.
4. Public Warning System (PWS) Branch.

Article (10)

The Data & Analysis Section shall undertake the following tasks:

1. Establish an integrated database for maintaining the operations plans and programs, maps, statistical diagrams and data.
2. Study and define the CDD needs of technical and technological systems,
3. Prepare the security studies and researches which are relevant to the plans, programs, operational planning and the security crisis response procedures.
4. Cooperate with the concerned security quarters to share information and the important analytical security studies.
5. Prepare security reports on crisis response procedures and submit such reports to the higher command at the Ministry of Interior and the AD Police.
6. Gather any information or statistics from the existing systems and reports; evaluate, analyse and highlight the main factors which might affect the incident.
7. Cooperate with the concerned quarters in *meteorology and forecasting* of natural events and the concerned quarters in the field of information and analytical studies of unnatural events.
8. Manage and maintain the public warning systems to ensure emergency response readiness.

Article (11)

The Data and Analysis Section shall comprise the following branches:

1. Command and control information systems Branch.
2. Statistical Analysis Branch.
3. Meteorology and Forecasting Branch.

Article (12)

The Business Continuity Section shall perform the following tasks:

1. Plan major incident management and ensure post incident business continuity at AD Police GHQ.
2. Explain the most important operational roles, tasks and responsibilities of AD Police GHQ, which ensure business Continuity.
3. Prepare the rules and criteria for business continuity preparations with the participation of the departments and general directorates of AD Police GHQ.
4. Follow-up on the development of business continuity plans concerning the human, financial, technical and physical resources at the ADP GHQ organizational units; follow-up on the developmental projects which are related to business continuity and lay down appropriate strategic plans and initiatives.

Article (13)

The Business Continuity Section shall comprise the following branches:

1. Business Continuity planning Branch.
2. Business Continuity Coordination and Follow-up Branch.
3. Recovery Branch.

Article (14)

The Support Services Coordination Section shall perform the following tasks:

1. Manage the department's postal services, communications and legal affairs.
2. Ensure provision of typing, correspondence, maintenance, archiving and secretarial services to facilitate office work.
3. Ensure provision of the financial and storage assets, documentation, monitoring and supervising its movement according to the regulations and the Finance and Inventory instructions.
4. Provide the technical and technological equipment and ensure its maintenance.
5. Carry out and follow-up on the personnel affairs according to the endorsed rules and regulation and the types of workers.
6. Coordinate transportation, general maintenance as well as other services to facilitate performance of qualitative activities.

Article (15)

The Support Services Coordination Section shall comprise the following branches:

1. Administrative Affairs Branch.
2. Personnel Branch.
3. Finance and warehouses Branch
4. General Services Branch

5. Technical Affairs Branch.

Article (16)

The Strategic Planning Branch shall perform the following tasks:

1. Follow-up on activation of the organizational structure and job description in coordination with the strategic planning Section - Department of Strategy and Performance Development.
2. Submit development proposals in accordance with the Quality systems requirements.
3. Follow-up on the implementation of the strategic and operational plans in coordination with the Strategic Planning Section of the General Directorate.
4. Follow-up on the implementation of projects related to the strategic plans and priorities.
5. Prepare regular progress reports on the branch activity to be submitted to the Department of Strategy & Performance Development.
6. Prepare and develop standard criteria for implementation of tasks and duties assigned to the department.
7. Cooperate and coordinate with the ADP GHQ quality assurance teams and committees and seek to propagate the culture of quality & excellence among the staff.
8. Supervise implementation of distinction criteria, and follow-up on the government excellence program requirements for police services in coordination with the Department of Strategy and Performance Development.
9. Monitor and follow-up on any complaints or proposals made by the clients about the quality of the police services rendered by the department.
10. Monitor internal and external public satisfaction surveys in coordination with the Department of Strategy and Performance Development.
11. Undertake any other activity assigned to the branch regarding client satisfaction, in coordination with the Department of Strategy and Performance Development.
12. Develop the spirit of innovation and creativity by encouraging the staff to participate in the police innovation award and submit proposals for boosting development and continuous improvement.

Article (17)

The Public Relations Branch shall perform the following tasks:

1. Prepare and supervise the implementation of the endorsed crises and disasters awareness programs in coordination with the concerned quarters.
2. Participate in the delivery of crises and disasters awareness lectures.
3. Supervise the proper organization of the reception halls in the Department and the process of directing the clients/visitors to their destinations.
4. Oversee the necessary arrangements for convening the official meetings held in the department.
5. Supervise organization of the social activities and special services arranged for honouring the workers or members of the public.

Article (18)

The Director's office shall perform the following tasks:

1. Management and organization of office work namely, correspondence, daily mail, minutes of meetings; receiving the Director's instructions, typing and dispatching his letters.
2. Maintain the schedule for Director's interviews and meetings; ensure that the director is notified beforehand provided with timely information and documentation needed for such meetings.
3. Ensure provision of communications, transportation and entertainment services as well as the other services in the manner that facilitates effective performance of work.
4. Coordinate with the departmental sections and the various external bodies to facilitate and follow-up on the implementation of the director's instructions.
5. Undertake public relations activity related to the Director's office.

Appendix (   ) shows training programmes delivered to staff of Emergency and Public Safety Department (EPS) during 2011- 2013. Venue, date , nature and details of the programmes are included

www.adpolice.gov.ae

القيادة العامة لشرطة أبوظبي
Abu Dhabi Police GHQ.

Sources: EPS, 2013

Appendix 9 Annual Training Programmes at ADP

Course	Beneficiary	Participants	Duration	Execution		Training Agency
				from	To	
Comprehensive Rescue 15 (Fire)	EPS	43	3 months	19/12/2010	20/3/2011	Training Section
Rescue from closed and confined spaces	EPS	9	One weak	,9/1/2011	,12/1/2011	Training Section
Rescue from closed and confined spaces	EPS	8	One weak	,9/1/2011	,13/1/2011	Training Section
Rescue from closed and confined spaces	EPS	8	5 days	30/1/2011	3/1/2011	Training Section
Basic SAR training course (643)	EPS	9	2 weaks	,6/2/2011	,17/2/2011	Training Section
Refresher training in the use of hydraulic, electric and manual tools, air bags and fire extinguishers	EPS	74	12	13/2/2011	24/2/2011	Training Section Training Unit/ Al Ain
Fire and rescue trainers training course	EPS	12	5 days	14/3/2011	24/3/2011	Training Section
Hazmat basic course (Group 1)	EPS	22	19	27/3/2011	14/4/2011	Training Section
Rescue from closed and confined (1091)spaces	EPS	17	5 days	24/4/2011	28/4/2011	Training Section
Rescue from closed and confined spaces	EPS	9	5 days	24/4/2011	28/4/2011	Training Section
Lift/elevator control course	EPS	19	18	9/5/2011	26/5/2011	Training Section
Rescue rehabilitation (Group 1) course	EPS	62	5 days	15/5/2011	19/5/2011	Training Section
Action in the event of fire outbreak	EPS	15	2	15/5/2011	19/5/2011	Training Section
Respiratory devices (1227) maintenance Basic course	EPS	14	5	15/5/2011	19/5/2011	Training Section
Fire fighter rehabilitation course (Group 1)	EPS	22	12	5/6/2011	16/6/2011	Training Section Al Aweer Center/Dubai
Fire fighter rehabilitation course (Group 2)	EPS	18	12	19/6/2011	30/6/2011	Training Section Al Aweer Center/Dubai
Fire fighter rehabilitation course (Group 3)	EPS	13	12	3/7/2011	14/7/2011	Training Section
Fire fighter rehabilitation course	EPS	13	30	3/7/2001	2/8/2011	Training Section
Firefighting training instructor course (Group 1)	EPS	4	12	25/9/2011	6/10/2011	Training Section Al Aweer Center/Dubai

Training session	Beneficiary	Participants	Duration (days)	Execution		Agency
				From	To	
Fire fighting rehabilitation course (Group 2)	(EPS)	13	12	9/10/2011	20/10/2011	Training Section Al Aweer Center/Dub:
Fire fighting rehabilitation course (Group 3)	(EPS)	9	12	23/10/2011	3/11/2011	Training Section Al Aweer Center/Dub:
Comprehensive rescue program (16) the art of cutting through vehicles and saving trapped persons (Group 1)	(EPS)	16	25	10/10/2011	15/11/2011	Training Section
Closed & confined space Refresher course	(EPS)	22	5	14/11/2011	17/11/2011	Training Section
Collapsed buildings refresher course	(EPS)	22	5	20/11/2011	24/11/2011	Training Section
Comprehensive Basic rescue program (15) Basic fire fighting course (Group 3)	(EPS)	40	100	18/9/2011	28/12/2011	Training Section
Fire fighting rehabilitation course (Group 1)	(EPS)	15	12	20/11/2011	1/12/2011	Training Section Al Aweer Center/Dub
Comprehensive rescue program (16) the art of cutting through vehicles and saving trapped persons (Group 2)	(EPS)	10	24	20/11/2011	13/12/2011	Training Section
Fire fighting rehabilitation course (Group 2)	(EPS)	11	11	4/12/2011	15/12/2011	Training Section Al Aweer Center/Dub
Fire fighting rehabilitation course (Group 3)	(EPS)	9	12	18/12/2011	29/12/2011	Training Section Al Aweer Center/Dub

Training session	Beneficiary	Participants	Duration (days)	Execution		Agency
				From	To	
fire service officers skills development	(EPS)	2	21	8/1/2011	28/1/2011	Federal Republic of Germany
Hazmat skills	(EPS)	23	48	31/1/2011	17/3/2011	UK
Preparation of Rescue instructors	(EPS)	12	21	4/4/2011	23/4/2011	Federal Republic of Germany
Descending from high places	(EPS)	11	19	6/6/2011	24/6/2011	Civil Defence Federal Republic of Germany
Descending from high places (Group 2)	(EPS)	11	19	6/6/2011	24/6/2011	Civil Defense Department Federal Republic of Germany
International workshop on disaster victim identification (DVI)	(EPS)	2	5	12/12/2011	16/12/2011	Republic of Indonesia, Semarang

Training session	Beneficiary	Participants	Duration (days)	Execution		Agency
				From	To	
Comprehensive rescue training program (16) Firefighting course (Group 1)	(EPS)	17	50	4/1/2012	19/4/2012	Training Section Civil Defence Academy Sweihan
Comprehensive rescue training program (16) (Group 4) First Aid - First Responder Level 3	(EPS)	8	20	18/12/2011	5/1/2012	Training Section
searching in debris of collapsed buildings	(EPS)	16	5	15/1/2012	19/1/2012	Training Section
Internal training/ western region (Group 4) Fire and listing of damages Personal Safety and Social Responsibilities nautical knots and ropes	(EPS)	8	5	29/12/2011	4/1/2012	Training Section
Comprehensive rescue training program (16) The art of cutting through vehicles and saving trapped persons	(EPS)	14	21	25/12/2011	19/1/2012	(EPS) Training Section
emergency response and buildings evacuation process	(EPS)	18	5	8/1/2012	12/1/2012	Al Khawarizmi International College (KIC), Abu Dhabi
Comprehensive rescue training program (16) The art of cutting through vehicles and saving trapped persons	(EPS)	10	24	23/1/2012	15/2/2012	(EPS) Training Section
Comprehensive rescue training program (16) (Group 5) First Aid - First Responder	(EPS)	10	12	29/1/2012	14/2/2012	(EPS) Training Section
Advanced diving course (460)	(EPS)	8	10	19/2/2012	1/3/2012	(EPS) Training Section

Training session	Beneficiary	Participants	Duration (days)	Execution		Agency
				From	To	
Ship fire control fundamentals Group 1	(EPS)	14	25	5/2/2012	1/3/2012	**Training Section EPS/ Western Region**
Ship fire control fundamentals Group 2	(EPS)	14	24	26/2/2012	22/3/2012	**Training Section EPS/ Western Region**

Ship fire control fundamentals Group 1	(EPS)	14	38	11/3/2012	19/4/2012	**Training Section EPS/ Western Region**
Basic Hazmat instructors training course	(EPS)	9	23	18/3/2012	12/4/2012	Good Harbor Center
Advance HAZMAT course	(EPS)	3	23	18/3/2012	12/4/2012	Good Harbor Center
First Aid and evacuation of victims during fire on board ships	(EPS)	4	12	15/4/2012	26/4/2012	**Training Section**
First aid, evacuation and sheltering (12768)	(EPS)	2	5	27/5/2012	31/5/2012	**Training Section** Millennium hotel, Wahda Mall, Abu Dhabi
First aid, evacuation and sheltering (12765)	(EPS)	2	5	27/5/2012	31/5/2012	**Training Section Training Department Lecture Halls**
First aid, evacuation and sheltering (12765)	(EPS)	3	5	27/5/2012	31/5/2012	**Training Section training Department Lecture Halls**
Ship fires Security procedures	(EPS)	40	23	13/5/2012	6/6/2012	**Training Section**

Training session	Beneficiary	Participants	Duration (days)	Execution		Agency
				From	To	
Beginners Diving Course (14045)	EPS	6	18	3/6/2012	21/6/2012	Training Section
First aid, evacuation and sheltering (12775)	EPS	6	5	3/6/2012	7/6/2012	Training Section EPS/ Al Ain
First aid, evacuation and sheltering (12783)	EPS	4	5	10/6/2012	14/6/2012	Training Section Police Officers Club Al Ain
Basic Swimming course (2209)	EPS	9	12	27/5/2012	7/6/2012	Training Section
Basic Swimming course (941)	EPS	14	12	17/6/2012	28/6/2012	Training Section
hydrocarbon fire control (13925)	EPS	17	12	3/6/2012	14/6/2012	Training Section in cooperation with the French police
Use of dangerous materials (13527)	EPS	15	12	3/6/2012	14/6/2012	Training Section in cooperation with the French police
Ship fire control fundamentals Al Ain	EPS	47	11	3/6/2012	14/6/2012	Training Section SAR Training Branch
First Basis Fire fighting course	EPS	4	100	11/3/2012	21/6/2012	Civil Defense Academy

Training session	Beneficiary	Participants	Duration (days)	Execution		Agency
				From	To	
Respiratory devices maintenance	EPS	6	5	23/9/2012	27/9/2012	Training Section Civil Defense Academy in cooperation with Emirates Fire & Rescue Company
Basic rescue training course (17)	EPS	11	11	9/9/2012	20/9/2012	Training Section EPS/ Al Ain
HAZMAT Training Level 1 __(1211)_	EPS	4	5	2/9/2012	6/9/2012	Training Department Holiday Inn Hotel, Abu Dha
(2155) Fire fighting rehabilitation course	EPS	6	12	14/10/2012	25/10/2012	Training Section
First Aid - Level 3 Basic Rescue Course (17)	EPS	14	12	23/9/2012	4/10/2012	Training Section
(15995) Beginners diving course	EPS	11	18	7/10/2012	24/10/2012	Training Section
Basic Rescue Course (17) (Groups 1 & 3) The art of cutting through vehicles and saving trapped persons	EPS	25	27	23/9/2012	18/10/2012	Training Section Civil Defense Academy
Fire instructors preparation course	EPS	3	18	30/9/2012	18/10/2012	Training Section Civil Defense Academy
First Aid and debris management training (15173)	EPS	2	10	21/10/2012	1/11/2012	Training Section in cooperation with The French Police Civil Defense Academy
Refresher respiratory devices course Group 3	EPS	14	13	30/9/2012	12/10/2012	Technical Rescue & Quic Intervention Section, Mohammed Bin Zayed Branch MBZ
Refresher respiratory devices course Group 2	EPS	11	14	4/10/2012	17/10/2012	Technical Rescue & Quic Intervention Section, Mohammed Bin Zayed Branch MBZ

Training session	Beneficiary	Participants	Duration (days)	Execution		Agency
				From	To	
Beginner Diving Course (15997)	EPS	4	18	11/11/2012	29/11/2012	Training Section SAR Training Branch
(17) Basic rescue course Group 4 (First Aid training course)	EPS	11	12	18/11/2012	29/11/2012	Training Section In cooperation with the French Police
Search & Rescue training course In cooperation with the Singaporean Civil Defense	EPS	4	31	8/10/2012	9/11/2012	Republic of Singapore
Exercising to prepare for classification as Heavy 2013	EPS	4	4	15/11/2012	18/11/2012	UK
UAE SAR team classification as heavy	EPS	3	12	28/10/2012	9/11/2012	Republic of Singapore
Radiation emergencies, prevention and response Bronze level	EPS	14	12	12/11/2012	23/11/2012	Seibersdorf Academy Vienna, Geneva
Using Fire extinguishers refresher course	EPS	29	3	11/12/2012	13/12/2012	EPS/ Western Region

Training session	Beneficiary	Participants	Duration (days)	Execution		Agency
				From	To	
Basic Rescue Course (17) (Groups 4) The art of cutting through vehicles and saving trapped persons	EPS	12	19	16/12/2012	3/1/2013	Training Section In Cooperation with the Civil Defense academy, Al Faya
Dealing with HAZMAT Basic course	EPS	16	12	20/1/2013	31/1/2013	Training Section In Cooperation with the Civil Defense academy, Al Faya
Safety advisors course	EPS	7	1	20/1/2013		Training Section In Cooperation with the Civil Defense academy, Al Faya
Fire extinguishers skills	EPS	5	1	21/1/2013		Training Section In Cooperation with the Civil Defense academy, Al Faya
Dealing with HAZMAT course for the trainers of the Civil Defense Academy, Al Faya	EPS	14	5	27/1/2013	30/1/2013	Training Section In Cooperation with the Civil Defense academy, Al Faya
INSARAG Teams training course (Level: heavy)	EPS	16	11	20/1/2013	31/1/2013	Civil Defense Department, Singapore

Postgraduate student wins Outstanding Achievement Award at the World ID Awards

Brigadier Ahmed Nasser Al Raisi (pictured), a postgraduate research student at London Metropolitan University, has been awarded the ID People's Award for Outstanding Achievement.

Ahmed Nasser Al Raisi, who is General Director of Operations for the Abu Dhabi Police, United Arab Emirates Ministry of Interior, was presented with his award on November 26 during the sixth ID World International Congress in Milan.
The awards were presented to members of the ID Revolution Community, in recognition of their contribution and achievements as thought leaders, innovators and pioneering adopters of the ID Revolution.

Ahmed Nasser Al Raisi is among the most influential people in Abu-Dhabi and the IT Industry. He has been involved with many strategic information and communication projects that have played a significant part in shaping the United Arab Emirates (UAE). His work includes the implementation of smart card technology for identity verification projects.

Ahmed Nasser Al Raisi was head of the steering committee and project manager at the time the United Arab Emirates' national project was formed and he was instrumental in the management and implementation of the project.

Other work that Ahmed Nasser Al Raisi has been involved with includes iris biometric, the largest iris database in the world, the e-Gate project, which is now used at all UAE airports, and the UAE national ID card.

Currently, he is an active member of the federal e-Government committee. His leadership skills have helped develop Abu Dhabi Police as one of the world's most effective police forces operating in one of the world' safest countries.

Ahmed Nasser Al Raisi has been supervised by Dr Peter Oriogun (Director of Study) from the Department of Computing, Communications Technology and Mathematics (CCTM), with Dr Amer Hosin (second supervisor) from the Department of Psychology and Professor Algirdas Pakstas (third supervisor) from CCTM since he enrolled in November 2007 to undertake research into 'Leadership Styles, Productivity and Management Indicators in the e-Government in Dubai'.

14 December

iD People

MOVERS & SHAKERS OF THE AUTO ID BUSINESS

ID WORLD

INTERNATIONAL CONGRESS

ID WORLD International Congress 2007:
ID People Awards

Brig. Ahmed Nasser *Al Raisi*,
General Director Operations of Abu Dhabi Police,
receives the ID Outstanding Achievement Award

Milan, November 29, 2007

Brigadier Ahmed Nasser Al Raisi, General Director Operations of Abu Dhabi Police, is one of the recipients of this year's ID People Awards – the Oscars of the auto ID industry. Brig. Al Raisi was announced winner of the ID Outstanding Achievement Award on November 26 at an exclusive ceremony at the sixth ID WORLD International Congress, the global summit on automatic identification.

The Outstanding Achievement Award is presented each year to the member of the ID Community that has produced the most concrete results in the field of Automatic Identification.

Brig. Ahmed Nasser Al Raisi is one of the most influential people in Abu-Dhabi and in the IT industry. He has been involved in many successful strategic information and communication technology projects that have contributed to shaping today's United Arab Emirates and is the key person who introduced smart card technology for the country's identity verification projects. He was project director for the UAE's national electronic ID card project, the roll-out of electronic gates in all UAE airports, and the country's iris recognition-based border control solution, which has produced the largest iris database in the world. His outstanding leadership has helped develop Abu Dhabi Police into an extremely effective force operating in one of the world's safest countries.

ID People Awards are presented in recognition of the contribution made by thought leaders, innovators and pioneering adopters who have distinguished themselves by their achievements during the past 12 months.

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GULF ✦ NEWS

Abu Dhabi Police, Harvard University School of Medicine sign MoU

posted on 17/04/2013

The Department of Emergency and Public Safety of the Directorate for Central Operations at Abu Dhabi Police's General Headquarters has signed a Memorandum of Understanding (MoU) with the Department of Disaster and Emergency Medicine at the Harvard University School of Medicine.

Signed in the presence of H. H. Lt. General Sheikh Saif bin Zayed Al Nahyan, Deputy Prime Minister and Minister of Interior, the MoU aims to contribute to developing and implementing the emergency medicine programme.

The event was also attended by Major General Nasser Lakhraibani Al Nuaimi, Secretary General of the office of Deputy Prime Minister and Minister of Interior, Major General Khalil Dawood Badran, Director General for Finance and Services at Abu Dhabi Police.

Major General Ahmed Nasser Al Raisi, Director of the Central Operations at Abu Dhabi Police signed on the behalf of Abu Dhabi Police, while head of Department of Disaster and Emergency Medicine at the Harvard University School of Medicine signed on behalf of Harvard University.

Sheikh Saif received a memento gift from the head of Department of Disaster and Emergency Medicine.

Khaleej Times

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(WAM) / 16 April 2013

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UAE Interact

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March 28, 2012

Abu Dhabi Police G.H.Q. receives Enterprise GIS Vision and Strategic Roadmap Award for its innovative use of Esri software.

Abu Dhabi Police G.H.Q. Receives Enterprise GIS Vision and Strategic Roadmap Award

Agency Recognized at the 2012 Esri Partner Conference

Redlands, California—The Abu Dhabi Police (ADP) received the prestigious Esri Enterprise GIS Vision Award in recognition of its advanced Esri platform that improves key areas, such as crime prevention, security, and emergency management. **The award was presented Tuesday, March 27, at the Esri Partner Conference in Palm Springs, California.** The annual Esri Partner Conference brings together global partners and distributors to celebrate their efforts and provide them with the environment to develop the strategies and skills that will extend the value of their businesses.

'Their success is a result of the vision and leadership shown by Major General Ahmed Nasser Al Raisi,' said Jack Dangermond, president, Esri. 'The Abu Dhabi Police use GIS to bring together people and processes for making better decisions.'

Abu Dhabi is one of the seven emirates that comprise the United Arab Emirates (UAE) and is also its capital. This city's extraordinarily fast development has naturally led to the typical urban concerns of police agencies everywhere including crime fighting, community safety, and intelligent response, which are global challenges as well.

The ADP Esri GIS enhances numerous capabilities. The approach, plans, and designs were benchmarked worldwide with leading law enforcement GIS implementers to ensure that ADP learns from best practices found elsewhere to provide a new standard for future police information systems.

Enterprise GIS services support police business and geoenable legacy police systems. They help easily find the location of emergency 999 callers, dispatch the nearest responders, and show nearby landmarks like hospitals and critical sites. The agency has dramatically reduced response times and eliminated manual descriptive guidance from the caller. GIS-based maps and analysis also help locate police resources and responders through an automated vehicle location system, allowing command and control (C2) officers to dispatch the nearest responder to the incident location. Responses have become more effective as a consequence of the much improved situational awareness provided to both the C2 officers and police responders. GIS is also used to provide a common operating picture with real-time data mapping related to the decision-maker's jurisdiction. GIS services fulfill the needs of ADP stakeholders at all levels.

Please see the link below: Copy and Google one of the link below

http://www.esri.com/news/releases/12-1qtr/abu-dhabi-police-ghq-receives-enterprise-gis-vision-and-strategic-roadmap-award.html

OR

Abu Dhabi Police G.H.Q. Receives Enterprise GIS Vision and - Esri

H.E Major General Ahmed N. Al Raisi

General Director

Central Operations

Abu Dhabi Police

UAE

Date: April 9, 2013

Subject: Government CEO Excellence Award Winner

With great pleasure we express our appreciation for Abu Dhabi Police, and your personal exemplary contributions towards modern leadership development in the government and corporate organizations.

Middle East Excellence Awards Institute, conceived by Datamatix, is honored to inform you that you are selected as this year's recipient of the 'Government CEO Excellence Award' based on the criteria and judging procedures adopted by the institution in selecting and honoring executive leaders for the extraordinary role that you have played in promoting the latest modern management and knowledge-based economy and competitiveness in the region.

On this great occasion, Middle East Excellence Awards Institution will honor the winners of the 10ᵗʰ Middle East CEO of the Year Awards in a special ceremony at 12noon on April 11, 2013 at the Burj Al Arab Hotel, Al Falak Ballroom in Dubai, UAE in conjunction with the 10ᵗʰ Leading CEO Conference, in the presence of prominent dignitaries and leaders, entrepreneurs, business owners, officials in government and business organizations from around the region. Your presence in the ceremony will be an honor for us.

Congratulations and we look forward to welcoming you at this highly significant event.
For more info, please visit www.meawards.com Sincerely

Ali Al Kamali,

Managing Director

معهد جائزة الشرق الأوسط للتميز
MIDDLE EAST EXCELLENCE AWARDS INSTITUTE
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- Dominique de Villepin, former French Prime Minister
- Anwar Ibrahim, former Deputy Prime Minister of Malaysia
- Igor Ivanov Russian national security adviser
- Larry Ellison, Chairman and founder of the Oracle world
- Dr. Gene Amdahl-founder and Director of Amdahl
- Kim Phuc UNESCO Goodwill Ambasaddor

Women Leaders Honored by the Institute

- H.H Princess Ameerah Al Taweel, Vice President Al Waleed Bin Talal Foundation.
- H.H Sheikha Fatima Bint Zayed Bin Saqer Al Nahyan, President, Umm Al Moumineen Women Association, Ajman UAE
- Sheikha Salama Bint Hamdan Al Nahyan, Wife of H.H General Sheikh Mohammed bin Zayed Al Nahyan, Crown Prince of Abu Dhabi and Deputy Supreme Commander of the UAE Armed Forces
- H.H Sheikha Amina Bint Humaid Al Tayer President of Al Nahda Philanthropic Society for Women
- Sheikha Hassa Saad Al Abdullah Al Sabbah Arab Businesswomen Council Chairwoman

Leaders Previously Honored by the Institute

- H.E Sheikha Lubna Al Qasimi UAE Minister of Foreign Trade
- H.E Shiekha Hessa Bint Khalifa Al Khalifa, Representative, UNDP, Bahrain
- Ms. Amat Al Alim Assistant Sec. General and Dir. of Regional Bureau of Arab States, UNDP
- Dr. Masouma Al-Mubarak Former Minister of Health, Kuwait
- Dr. Nouriya Al Sobeeh, Former Minister of Education, Kuwait
- Dr. Amani Bouresli Minister of Commerce and Industry – KUWAIT
- H.E. Mervat M Tallawi, Executive Secretary of UNESCWA
- Sheikha Hanadi Nasser Bin Khaled Al Thani, Chairperson and founder of Amwal
- Prof. Sheikha Bint Abdulla Al Misnad, President Qatar University
- Issa Al Gurg Dubai business women Council Chairperson
- Dr. Nahed Mohammed Taher, CEO Gulf One Investment Bank

For More Information please visit www.meawards.com

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