

Safety & Security Management through 3E

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Abstract

Risk Management in different built environments is not an easy job. Risk Management in a single built environment of multiple occupancies is not only uneasy but also an unfailing job. Building Officials always face a dilemma in the Safety and Security Management of such built environment. In this paper, a 3E Approach is introduced to the Building Officials as a safety and security solution.

Keywords: 3E; Detention Facilities; Density Elimination; Hardware Enhancement; Software Enrichment.

1 Introduction

Risk Management of a building with multiple occupancies is based on the analysis of the Compound Risks of some Critical Incidents under the Total Concept Approach. Analyzing risks in 3D (Density of Detention + Defects of Hardware + Deficiency of Software), the Risk Priority Indicator enables the Building Officials to assess the Compound Risk Level the existing Detention Facilities at 3 levels, High, Medium or Low (Exhibit 1).

Exhibit 1: Risk Analysis in 3D

$$\mathbf{RPI = DD*HD*SD}$$

Risk Priority Indicator = Detention Density x Hardware Defect x Software Deficiency

(Source: <http://www.paper.edu.cn/process/download.jsp?file=200503-98>)

Under resources constraint, priority can be accorded to the remedy of Detention Facilities of High Risk. The possible solutions could be 3E:

- ✧ **Elimination of Density (ED)**
Eliminate the high density of the Detention Facilities or the frequent use of the particular Detention Facilities
- ✧ **Enhancement of Hardware (EH)**
Modification or Rectification of the Hardware Items
- ✧ **Enrichment of Software (ES)**
Introduction of procedures, rules and regulations governing the use of the Detention Facilities or handling of Detainees

2 Safety & Security Management through 3E

‘Safety & Security Management’ can be defined as ‘a system designed to enable effective and efficient Critical Incident management by integrating a combination of facilities, equipment, personnel, procedures, and communications operating within a common organizational structure.’ Moreover, it can be construed as the combination of Hardware (premises exclusively used for detention or occupancies used for temporary detention) and Software (handling of Detainees in lawful custody) under a ‘Total Concept Approach’.

2.1 3E in Total Concept Approach

Architectural designs of the Hardware, in particular the border stations not built for the purpose of detention, are predetermined by their original design or intended multi-occupancy. Thus, there would be inherent Hardware Defects in terms of Safety & Security Management. In such circumstances, the safety and security of the people in lawful custody could not be solely ensured by dependence on the hardware items. Their protection from Critical Incidents should be provided by appropriate arrangement of Detention Facilities; adequate, trained staff; and development of operating, security and maintenance procedures.

2.1.1 Elimination of Density

In the light of Critical Incidents, it is believed that as the number of detainees decreases, risks tend to decrease proportionately. With a lesser detention density and lower utilization rate, it is likely that the possibility of critical incidents would decrease. Statistics suggest that a greater detention density and higher utilization rate may have bigger opportunities of Critical Accidents. Therefore, Density Elimination (Exhibit 2) can be a Mitigating Factor in the Risk Management.

Exhibit 2: Low Density Detention Facilities in America



(Source: http://www.clallam.net/JuvenileServices/assets/images/lg_photo12.jpg;
http://www.clallam.net/JuvenileServices/assets/images/lg_photo08.jpg;
http://www.clallam.net/JuvenileServices/assets/images/lg_photo10.jpg)

2.1.2 Enhancement of Hardware

Under the ‘Total Concept Approach’, ‘Risk’ is a compound of ‘Hardware Defect(s)’ and ‘Software Deficiency’. Naturally, Hardware Enhancement could be another Mitigating Factor in Risk Management. Taking the furniture and internal household wares of a detention facility as an example,

usage of general grade hardware would constitute a Hardware Defect and induce risks. For instance, a detainee could use portable furniture as stool, torn-out blanket as string, overhead structure as an anchoring point to commit suicide. Conversely, detention grade hardware (Exhibit 3) can enhance the security and safety of the detainees.

Exhibit 3: Detention Grade Hardware in American Detention Facilities



(Source: <http://www.lfucg.com/PubSafety/Detention/Images/SingleCell.jpg>;
http://www.clallam.net/JuvenileServices/assets/images/lg_photo09.jpg;
http://www.clallam.net/JuvenileServices/assets/images/lg_photo15.jpg)

2.1.3 Enrichment of Software

Software Deficiency would also jeopardize the detainees' safety and security. In case of a Hardware Defect, e.g., the absence of a remotely activated system capable of unlocking all doors in the means of egress, relevant Software Enrichment (Exhibit 4) would mitigate the risk due to the inherent Hardware Defects. For instance, there should be sufficient members or attendants in the subject Detention Facilities, who are continuously on duty, provided with keys, and stationed in the immediate area of all locked means of egress doors.

Exhibit 4: Software Enrichment in Safety & Security Management of American Detention Facilities



(Source: http://www.clallam.net/JuvenileServices/assets/images/lg_photo14.jpg;
http://www.clallam.net/JuvenileServices/assets/images/lg_photo03.jpg;
<http://www.washoesherriff.com/Webpage%20Photos/Detention/images/Intake%20area.JPG>)

3 Mitigation of Compound Risks through 3E

Referring to the contemporary thought in Safety & Security Management, the Compound Risks of the people in the lawful custody could be mitigated by means of the 3E Approach. The 3E Approach will bring up safety and security solutions which are well supported by some experiences and strategies of the law enforcement agencies in the modern nations. Building Officials will find 3E Approach feasible.

3.1 Canadian Experience & Strategy

In Canada, the border stations always house the offices of Canadian Customs and Revenue Agency (CCRA). CCRA maintains detention rooms at border which are deemed as ‘Contained Used Areas’. Border stations housing those detention facilities, however small, are governed by the National Building Code. In some of the border stations, CCRA’s detention facilities are rarely used. When they are occupied, they are usually used for a short duration up to 24 hours until the detainees are removed by the responding law enforcement agencies.

When the border stations are not exclusively built for detention, inherent Hardware Defects could be found therein. As a result, the National Building Code requirements create an undue financial burden on Customs operations. In such circumstances, CCRA applies a 3E Approach (Exhibit 5) towards the Safety & Security Management of its detention rooms in some border stations.

Exhibit 5: Canadian Experience & Strategy in Safety & Security Management

| ED | EH | ES | Solutions |
|----|----|----|--|
| ✓ | | | The Building is not more than two (2) stories in building height and has a maximum building area of 400 M ² . |
| ✓ | | | No more than one (1) detention room is located within the building. |
| | ✓ | | The detention room is located on the ground floor of the building. |
| | ✓ | | The detention room is separated from the remainder of the building by at least 2-hour fire separation. |
| | ✓ | | The closures in the fire separation are equipped with weather-stripping or are designed and installed to retard the passage of smoke. |
| | ✓ | | The building is to be equipped with a fire alarm system in conformance with the National Building Code and Treasury Board Fire Protection Standards. |
| | ✓ | | A smoke detector is to be provided in the detention room and in locations between the detention room and the remainder of the floor area. In addition, a smoke detector is to be provided in the bond room, the search room, the Local Area Network server room, the public washroom and in the corridor outside of the emergency sleeping room. |
| | ✓ | ✓ | The fire rated door for the detention room is provided with a wired glass window for the purpose of surveillance or inspection. |
| | ✓ | ✓ | The fire rated door for the detention room is readily openable from the outside without requiring keys, special devices or specialized knowledge of the door opening mechanism. |
| | ✓ | ✓ | Where a building is located within a 30 minute fire department response, the fire alarm system shall be designed to notify the fire department upon activation of a fire alarm signal. |
| | | ✓ | When the detention room is occupied, supervisory staff must be on duty in the building for the duration; supervisory staff must physically conduct an inspection at least every 15 minutes. |
| | | ✓ | A fire safety plan is to be provided and shall incorporate specific procedures for the |

| ED | EH | ES | Solutions |
|----|----|----|--|
| | | | immediate evacuation of the detention room in case of fire or other emergencies. |

(Source: Canada Customs and Revenue Agency, 2004)

3.2 American Experience & Strategy

Like the Canadian counterpart, American law enforcement agencies adopt the Total Concept Approach and 3E Approach as well. The former demonstrates a ‘Protect-in-Place’ Strategy in the Safety & Security Management of detention facilities while the latter shows the application of ‘Defend-in-Place’ Strategy (Exhibit 3). It is clear that these two strategies with 3Es are integral parts of Total Concept Approach. These experiences and strategies provide Building Official with a foundation of the most appropriate contemplation in the Safety & Security management of Detention Facilities in built environments of multi-occupancy.

Exhibit 6: American Experience & Strategy in Safety & Security Management

| ED | EH | ES | Solutions |
|----|----|----|---|
| ✓ | ✓ | | Locate critical offices near the inner core of the building to afford maximum protection and avoid surveillance from outside. |
| ✓ | ✓ | | Arrange office spaces so unescorted visitors can be easily noticed. |
| | ✓ | | Install key-card access systems at main entrances and other appropriate doors. |
| | ✓ | | Upgrade perimeter control systems with intercoms and closed circuit-monitoring devices. |
| | ✓ | | Have a back-up communication system, such as two-way radios. |
| | ✓ | ✓ | Develop crisis communication among key personnel and security officers, involving intercoms, telephones, duress alarms or other concealed communications. |
| | ✓ | ✓ | Keep closets, service openings, telephone and electrical closets locked at all times. |
| | | ✓ | Issue access control badges, with recent photographs, to all employees and authorized contractors. |
| | | ✓ | Keep master and extra keys locked in a security office. |
| | | ✓ | Have staff follow strict access control procedures, do not allow exceptions. |
| | | ✓ | Keep offices neat and orderly to identify strange objects or unauthorized people more easily. |
| | | ✓ | Protect crucial communications equipment and utility areas with an alarm system. |

(Source: United States Customs and Immigration Enforcement, 2004)

4 Safety & Security Solutions

Detention Facilities in buildings of multiple occupancies are compatible with a Total Concept Approach in their Safety and Security Management – complete with a blend of ‘Defend-in-Place Strategy’ and a ‘Protect-in-Place Strategy’. People in the Lawful Custody are placed in defensible facilities which make them incapable of self-preservation because of security restrictions. Security restrictions prevent them, to a large extent, free and customary movement and access to other areas of a building in which the Detention Facilities are located. Simultaneously, the People-in-Authority holding the People-in-Custody have a duty of care to offer protection to the detainees.

In general, many of the normal features needed in a Detention Facility are nearly the exact opposite of what the Building, Life and Fire Safety Codes attempt to provide for other occupancies. The use of locked doors, often with key-operated locks; egress components for which use is restricted or traffic flow is constricted; and discharge of exits onto other than public ways are features not usually permitted in other occupancies. In contrast, safety and security requirements are essential to the management of a detention facility.

5 The Way Forward

Safety & Management of Detention Facilities in built environments of multi-occupancy is not an easy job. Building officials may be thrilled at going to the arena of managing the Compound Risks. Building Officials need to devise safety and security solutions through a holistic view of the Risk Factors contributing to the occurrence of Critical Incidents, for instance, Death or Injury in the Lawful Custody and Escape from the Lawful Custody.

In many nations, there are numerous built environments in which multiple occupancies exist. For instance, those border stations facilitating people and cargo movements are built environments exist for mixed users and multiple occupancies. Tackling such built environments, Building Officials can adopt the Total Concept Approach in parallel with 3E Approach in the Safety & Security Management of Detention Facilities therein. It is evident that Eliminating the Detention Density, Enhancing the relevant Hardware as well as Enriching the Software in force could be possible solutions in this regard.

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Author's Profile

Gryphon Sou is an International Professional Engineer with credentials from America, England, Germany, France and Africa. He also registered as an Applied Science Technologist in the province of British Columbia, Canada and enrolled in the class of Overseas Senior Member of the Chinese Mechanical Engineering Society, People's Republic of China. He is elected Fellowship of The Institution of Incorporated Engineers, The Society of Professional Engineers & The Institution of Diagnostic Engineers as well as membership of The Association of Building Engineers, England. He has been admitted a member of the 'World Organization of Building Officials "in Special Consultative Status with the Economic & Social Council of United Nations and in Consultative Status with the United Nations Industrial Development Organization" (WOBO)' since 2004.