Introduction

• Mirza S Altaf Hussain, CPP, MBA, NEBOSH-IGC
  – Active member of ASIS Dubai Chapter 250 since 2011
  – CPP Trainer for ASIS Dubai Chapter 250
  – Executive Committee Member since 2013
  – Young Professional Liaison since 2013
Guidelines and Rationale for Physical Security Counter-measure Placement within an Educational Setting

Focus on the principles behind designing a layered system of security counter-measures which can be applied in an educational environment
ADEC Guidelines for Private Schools

- Abu Dhabi Education Council (ADEC) recommend to use IP technologies
- ADEC policy 5210 focuses on Security Video Surveillance System (CCTV) with following in mind:
  - Enhance Security
  - Respect privacy
  - Control access to recordings
Purpose for CCTV

• Promote a safe learning environment.

• Increase personal safety of students, staff and visitors.

• Deter and detect crime, vandalism, unlawful behavior and inappropriate conduct.

• Protect school buildings and their assets.
ADEC Suggested Locations For Cameras

- Promote a safe learning environment.
- All entrances and exits of building and school grounds.
- All walkways and public areas (corridors, stairs, courtyard, sports areas, canteen).
- Learning Resource Center (libraries).
- Student pickup and drop-off areas (private vehicle and bus).
- Security areas and hazardous areas (control room).
- Exterior areas surrounding the school grounds.
- Cameras shall not be installed in classrooms and lavatories.
# ADEC Suggested Locations For Cameras

<table>
<thead>
<tr>
<th>S/N</th>
<th>Location</th>
<th>Observation Criteria</th>
<th>Surveillance Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Student Pick up &amp; Drop off</td>
<td>Recognize</td>
<td>Vehicle Number Plate, type and color of vehicle, passenger and overview of surrounding area. Fixed cameras PTZ cameras required for general surveillance</td>
</tr>
<tr>
<td>2</td>
<td>Landscape</td>
<td>Detect</td>
<td>Landscape cameras shall cover the school perimeter.</td>
</tr>
<tr>
<td>3</td>
<td>Main Entrance &amp; Lobby</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a</td>
<td>Main entrance</td>
<td>Identify</td>
<td>Both entry and exit view Fixed cameras(WDR &amp; IR)</td>
</tr>
<tr>
<td>b</td>
<td>Reception lobbies</td>
<td>Recognize</td>
<td>Fixed cameras and PTZ cameras for general surveillance</td>
</tr>
<tr>
<td>c</td>
<td>Cashier</td>
<td>Identify</td>
<td>Front view of the customer and transaction. Complete view of the counter with no dead zones. - Fixed cameras</td>
</tr>
</tbody>
</table>
## ADEC Suggested Locations For Cameras

<table>
<thead>
<tr>
<th></th>
<th>Other Building Access points</th>
<th></th>
<th>Entry &amp; Exit view - Fixed cameras (WDR &amp; IR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Access points to all school buildings</td>
<td>Recognize</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Elevator Lobbies</td>
<td></td>
<td>People entering and exiting elevators – Fixed cameras</td>
</tr>
<tr>
<td></td>
<td>Elevator lobbies in BOH, FOH and Car park where entry &amp; exit from building is possible</td>
<td>Recognize</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Circulation Corridor</td>
<td></td>
<td>Fixed cameras</td>
</tr>
<tr>
<td></td>
<td>Circulation corridor on all floors</td>
<td>Recognize</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Emergency Exit</td>
<td></td>
<td>Entry or exit view based on the direction of emergency exit Fixed cameras (WDR &amp; IR)</td>
</tr>
<tr>
<td></td>
<td>Emergency exits on all school buildings where entry &amp; exit from building is possible</td>
<td>Identify</td>
<td></td>
</tr>
</tbody>
</table>
# ADEC Suggested Locations For Cameras

<table>
<thead>
<tr>
<th></th>
<th>Staircases</th>
<th></th>
<th>Canteen</th>
<th></th>
<th>Chemical Labs</th>
<th></th>
<th>Auditoriums/Ground / Play areas / Sports Hall /Swimming Pool</th>
<th></th>
<th>Entrances to Janitor room/ Wash rooms / Stores</th>
<th></th>
<th>Inside school buses</th>
<th></th>
<th>All outdoor cameras</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>Staircase on all floors</td>
<td>Recognize</td>
<td></td>
<td></td>
<td>Recognize</td>
<td></td>
<td>Recognize</td>
<td></td>
<td>Recognize</td>
<td></td>
<td>Recognize</td>
<td></td>
<td>Recognize</td>
<td>Minimum 3 fixed camera (WDR &amp; IR) to cover the whole bus seating area. All video shall be recorded at 4 CIF/6.25 FPS</td>
</tr>
<tr>
<td>9</td>
<td>Canteen</td>
<td></td>
<td>All canteen entries</td>
<td>Recognize</td>
<td></td>
<td></td>
<td>Fixed cameras(WDR &amp; IR)</td>
<td></td>
<td>Recognize</td>
<td></td>
<td>Recognize</td>
<td></td>
<td>Fixed camera</td>
<td>Shall be with IR illuminator (Min.30 Meter)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Kitchen entry/exits</td>
<td>Recognize</td>
<td></td>
<td></td>
<td>PTZ camera for general surveillance</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Canteen Dining Area</td>
<td></td>
<td></td>
<td></td>
<td>Entry View - Fixed cameras</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Food delivery and storage areas</td>
<td>Recognize</td>
<td></td>
<td></td>
<td>Fixed cameras</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Cashier</td>
<td>Recognize</td>
<td></td>
<td></td>
<td>Fixed camera</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Chemical Labs</td>
<td>Recognize</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Recognition</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Auditoriums/Ground / Play areas / Sports Hall /Swimming Pool</td>
<td>Recognize</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Recognition</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Entrances to Janitor room/ Wash rooms / Stores</td>
<td>Recognize</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Recognition</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Inside school buses</td>
<td>Recognize</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Minimum 3 fixed camera (WDR &amp; IR) to cover the whole bus seating area. All video shall be recorded at 4 CIF/6.25 FPS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>All outdoor cameras</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Shall be with IR illuminator (Min.30 Meter)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
ADEC Suggested Locations For Monitors

• They shall be installed in the office of the Principal and Vice Principal.

• In security office for the purpose of monitoring the facility outside of school hours and overnight.

• Male security guards shall not have access to viewing CCTV footage of girls’ schools during the school day.
ACCESS to Recording

• Principal and Vice Principal are authorized to view and retrieve the recordings.

• CCTV recordings of female students and staff shall be monitored by female Principals and Vice Principals only.

• All other school-based staff members are strictly prohibited from accessing recordings.
ADEC’s Suggestions on Recording

• Retained for a period of 180 days at 12-30 FPS.
• System shall support MJPEG/MPEG4/H.264 compressions
• System shall have capacity of 25% expansion
• Redundancy at min. RAID5 with hot standby HDs such as failure of system shall not affect overall system as well as automatic redistribution of cameras
• Record should have camera#, location, date/time stamp
• All systems should be time synchronized such as IDS, Access control, CCTV etc.
ADEC’s Suggestions on Recording

• Retained for a period of 180 days at 12FPS.

• If incident captured in a recording that requires clarification beyond the school level, Cluster Manager shall coordinate with the Executive Director of ADEC.

• No copy of any recordings may be shared with any person or entity unless upon a judicial order or by prior written approval of the Executive Director of ADEC School Operations.

• Duplication or distribution of recordings is strictly prohibited and punishable by law. School is responsible to maintain confidentiality of CCTV recordings.
ADEC’s Suggestions on Recording

• System must have 3 types of recordings:
  – Motion
  – Continuous
  – Video analytic

• End-user must have access to live footage anywhere in the premises on network.
ADEC’s Suggestions on Cameras

• IP camera with H.264 encoding and security features of HTIPS & 802.1x
• Camera must support resolution from CIF to 4CIF/HD
• I-frame rate shall be at least one I-frame once every 1-4 sec.
• Indoor camera: Color camera with 20 Lux illumination
• Outdoor camera: Camera with IR cut filter
• Area with variation in lighting condition: WDR cameras (with 120db)
ADEC’s Suggestions on Cameras

- Camera/encoder streams shall be streamed as transport RTP/UDP
- VMS shall support multicast streaming
- Camera/encoders shall be synchronized with GPS time
- Analog camera: min. resolution of 540 TVL
- Any camera selection should be depended on observation criteria
ADEC’s Suggestions on Observation Criteria

• Four categories of Observation Criteria based on relative size of 1.6m tall person appearing on monitor:
  – Monitor & Control
  – Detect
  – Recognize
  – Identify
ADEC’s Suggestions on Monitoring and Control Room

- Operator shall be trained on event response
- Resolution of monitors shall exceed the highest resolutions camera used
- # of monitors will depend on # of cameras and integration with other systems
- Alarms integrations shall alert visually as well as audibly
- Max. 9 camera’s view on screen of 17”-21” monitor
ADEC’s Suggestions on Lighting

• Max. to min illumination ratio available in the field of view shall be better than 4:1
• IR illuminators shall be provided, where lighting conditions can not be maintained
• Following conditions should be considered before selecting camera, location and lighting:
  - Back lighting
  - Glare
  - Poor/no lighting
ADEC’s Suggestions on Transmission

• Design shall support video delivery with min. delay, loss and jitter
• Design shall provide end to end security, limiting unauthorized access
• Shared transmission network is not recommended
• All switches shall have 1+1 redundant power supply and cooling fans
• School is responsible for performance of system:
  ➢ Network availability
  ➢ Network security
  ➢ Bandwidth availability
  ➢ Maintaining source image quality
  ➢ Min. Latency (Inline with manufacturer’s limit)
ADEC’s Suggestions on Network switches/firewall

- VMS shall be compatible with MCC provided IP scheme
- If school uses multicast routing, routing shall be based on PIM-SM
- Core level switches (layer-3) must be redundant in nature with 2 physical core switches
- Four core single mode fiber connectivity from equipment rack for integration to Etisalat POP room
- Firewall shall be default gateway for VMS
ADEC’s Suggestions on VMS

• VMS shall have failsafe mode (For automatic NVR switchover)
• VMS shall support multicast streaming (ICD-Interface control document)
• VMS shall allow connection to other systems through WAN/LAN
• VMS shall allow realtime and recorded video stream, in non-encrypted RTP/UDP protocol
• VMS shall support the recommended compressions
ADEC’s Suggestions on servers

• Servers shall have failsafe mode (For automatic server switchover)
• Servers load shall not exceed an average of 70%
• Server shall have dual processors, dual powers and min. 1Gbps dual communication uplinks to network
ADEC’s Suggestions on Storage

• Storage shall have min. RAID 5 or above configured
• HD shall have min. level of 7200rpm
• Storage shall have dual processors, dual powers and dual network uplinks to NAS/SAN switches
• Min. of 20TB storage
ADEC’s Suggestions on Alarm logs

• Alarms logs for all events:
• For cabinet open/close
  – Loss of system communication
  – Loss of camera signal
  – System power down
• 180 days of logs shall be available
ADEC’s Suggestions on CCTV installation

• Install on inaccessible height
• Camera on accessible height shall be vandal proof
• Outdoor camera with IP65 rated enclosures, sun shade and cooling mechanism
• All equipments shall be kept in lockable cabinets
ADEC’s Suggestions on Power

- CCTV system shall be on additional UPS backup of min. 15mins, provided generator will start within 10mins of power failure
- CCTV system shall be on additional UPS backup of min. 2hrs, if generator are not available or they are not guaranteed in case of power failure
- System shall restart automatically without human interaction
- Power distribution shall be from secured location
ADEC’s Suggestions on Maintenance

• On call response time shall not exceed 2hrs
• Maintain log for all maintenance and stoppage
• Quarterly maintenance shall include:
  ➢ Inspection & confirmation on correct operations
  ➢ Full system tests to evaluate performance
  ➢ Inspection of field devices & cleaning
  ➢ Rectification and reporting of any condition
ADEC’s Suggestions on Training

• School shall train following:
  - Operators on event response
  - Maintenance team on maintenance of system
  - Two representative on video review, export and system health check

• School shall maintain following credentials:
  - Training certificates
  - Qualifications
  - Past employment history
ADEC’s Suggestions on Documentation

• School shall maintain following documentations:
  ➢ Maintenance contract
  ➢ Trade license
  ➢ As built drawings
  ➢ Maintenance manuals
  ➢ Operational manuals
  ➢ List of people having access to videos
  ➢ Risk assessment report
  ➢ Site plan with camera icons and identification numbers
ADEC’s Suggestions on Signage

• School shall place signage in Arabic and English languages with camera icon stating following:
  “CCTV cameras in operation”
ADEC’s recommendations on location, surveillance and observation criteria

• School shall carry out their own risk assessment, before installation
• School shall budget in phases to cover whole building from fences, gates, entrances to all internal areas.
• School may approach approved vendors only
Educational setting

• School shall carry out their own risk assessment, before installation to find the level of countermeasures needed

• Most of the school do not need systems more than:
  – Locks
  – Keypads & electronics locks
  – PAS system
  – CCTV
Educational setting

• School shall find the level of countermeasures needed
  – Detect
  – Deter
  – Deny
  – Destroy

• No system/machine can guarantee 100% security, without focusing on man and method.

• School should find the right balance in their efforts to ensure security.
Thank you.

Please feel free to ask any question.