UH Security Systems Installation, Operations and Support Program Standards
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1.0 Revision Notes

1. Current revision 3.3

2. Revision Date: March 2012

3. Changes from Rev 3.2:
   a. Replacement of Aerocont 180 degree cameras with Scallop Imaging Panoramic Cameras
   b. Camera model specifications and use requirements
   c. Guidelines for new camera selection process
   d. Revised sub-section numbering format.
2.0 Introduction

The University of Houston Information Technology Network Operations has determined the need for a video based detection and investigation camera system and has defined the need to install, maintain and operate a Digital Video Security Camera System for the remote monitoring of the Campus Area. The University of Information Technology Network Operations has determined the need for Digital Security Controls alarms systems as well as Code Blue emergency phones.

2.1 Purpose

To define required ongoing support and maintenance program in the most operationally consistent method for each of the security systems.
3.0 Future Enhancements

Future feature enhancement and system vision potential includes:

✓ Automatic Tracking of “Stationary too Long” objects.
✓ Objects that “Don’t Belong”
✓ Automatic Vehicle License plate reading and Checking.
✓ Facial Recognition and personnel tracking.
✓ Automatic vehicle tracking.
✓ Tie into 911 call box facilities
✓ Tie into security door systems
✓ Tie into “Intelligent Building systems” such as fire and emergency exit alarms.
4.0 Operational System Architecture

The initial camera system consists physically of the following main elements:

- 53 Digital Video Recorders capable of supporting 16 or 8 cameras each (located strategically throughout Campus)
- Up to 531 Cameras (Located throughout Campus.)

The system is designed to allow the addition of components and upgrade of equipment without major infrastructure change of the program. Initially the system features a mixture of pan, tilt and zoom (PTZ) and fixed surveillance cameras with online video storage for playback. The Playback storage can be as long as 30 days per camera but is dependent upon the DVR model purchased for a particular camera system.

The initial framework is outlined below and can be modified as the University develops experience with video based detection and investigation systems.

1. Utilize all applicable industry installation codes, standards and practices for security camera systems and telecommunication wiring methods. This includes:
   - NEC
   - BICSI
   - EIA/TIA
   - Lightning protection
   - Manufacturer’s recommended practices.

2. For each system element, full documentation is maintained. This should include:
   - GIS layout diagram of the camera system
   - System manuals
   - As-built drawings
     - Locations of:
       i. Cameras, Code Blue Phones, DSC Equipment
       ii. DVRs
       iii. Cable paths

3. Camera connectivity is provided by a mixture of – Direct run Co-Ax and Category 5e Unshielded Twisted pair (UTP), point to point dedicated Ethernet and Ethernet connection over the University network on a separate VLAN.
4. Each of the system electronic components is designed to report back operational status from the campus equipment to the monitoring facility ITAC. An electronic component is any element including: cameras, Ethernet switches, DVRs, Alarm Panels, Code Blue Phones, radio etc. ITAC will utilize these design features for proactive fault alarming and historical tracking of equipment failures.

5. A daily maintenance check of the operation of each DVR and camera, where applicable, should be automated. This check will be provided at the SNMP level by ITAC. The daily maintenance checks for live video feeds will be done manually and will be completed by Public Safety/COC. This should include available storage capacity, DVR accessibility, camera PTZ operations and video image capture.
5.0 Maintenance and Support

A standard tiered support structure will be implemented. The tiered structure of maintenance is designed to ensure that system monitoring and technical expertise is available to the program owner as well as the operational support owner.

Faulty system components can be replaced within three hours if a spare is on hand. A standardized equipment component spares will be maintained at ITNO Room 181 consisting of at least one of each type of system components and more for more failure prone elements. See Appendix B for equipment list.

Ensure that there are certified and trained personnel with the necessary maintenance equipment and system expertise to maintain and support the UH Public Safety Security Program.

Utilize existing break/fix reporting processes via ITNO Customer Services to ensure timely repair and work coordinates. Anchor Point is the application used by ITNO to facilitate work updates and management reports.

5.1 Performance Monitoring and Management Reporting:

Each intelligent security system component within the existing security system will be electronically monitored for correct operation of network connectivity by ITAC and Public Safety/COC will monitor the direct video feeds for correct operation.

5.2 Tier One Support (UH ITNO Technician)

Tier One Support shall include:

- ITNO Security Camera Technician III is specialized for daily operational support supplemented by all current technical field personnel factory-trained by camera manufacturer (PELCO).

ITNO Technician(s) shall be:

- Factory trained and certified in each camera system element
- Capable of quickly identifying faulty equipment
- Be trained and knowledgeable in each:
  - Installation code and practices.
  - Industry standard.
  - Safety procedures applicable to the job.
  - Operation of equipment required to complete the repair.
    - ITNO Bucket Van
ITNO Technician Direct Duties Include:
- Work service work requests dispatched from ITNO Customer Services
- Trouble-Shoot
- Execute and effect repairs if possible
- Replace the faulty element utilizing the inventory of spares maintained at ITNO Room 181.
- Coordinate faulty equipment replacement or repair by the factory in a timely manner.

If the Technician cannot identify the fault within three hours the problem shall automatically be escalated to Tier Three. Tier one and Two Technical Support will work closely together with Tier Three to isolate and resolve the problem.

### 5.3 Tier Two Support

This group will consist of UH ITNO Network Analysts, Project Managers, Network Planning and Design personnel and Audio Visual personnel as needed.

Tier three support personnel shall be:
- **Project Managers**
  - Factory trained camera system expert capable of carrying out all the duties of the technician in addition to deployment and administration of the camera system.
  - Maintain all system documentation and records.
  - Have ultimate responsibility for the network operation and support of the UH Security Camera System.
- **Network Analysts**
  - Factory Trained to afford capability for understanding Security Camera Systems
  - Responsible for network systems in support of Security Camera Systems

- **Network Planning and Design Personnel**
  - Factory trained camera system expert capable of design, deployment and administration of the camera system.
Tier three support personnel shall:

- Utilize factory support which is available as required to resolve system issues. (Escalation to Tier Four Support)
- Utilize factory expertise to assist in the best design, installation and operation practices.
- Act as the technical (supervisor) project manager and technical consultant on the deployment of systems.

5.4 Tier Three Support (Installation Contractor and/or Manufacturer/Local Supplier Technical Support)

Tier Three Support Personnel shall:

- Installation Contractor
  - Provide technical assistance when needed to Tier 1 and 2 personnel.
  - Ensure that all installation and support personnel employed by contractor or acting as contractor’s agents are Pelco factory-trained, certified and maintain current certification, maintenance contracts and/or time and material contracts, as required, are in place to support the operation.
  - Establish, foster and maintain positive working relationships with both the sales and technical elements of the factory.

- Manufacturer - Pelco 24/7 Technical Support
  - Ensure that equipment is repaired and returned in a timely manner.
  - Establish, foster and maintain positive working relationships with both the sales and technical elements of the factory independent of any sub-contractor representatives and UH designated personnel providing operational support and workings on the program.

5.5 System Repair Ownership

System repair ownership belongs to Tier One initially, Tier Two for infrastructure, network access and distribution issues and Tier Three and Four supporting complex issues and working with Tier One and Two to resolve for all tasks associated with:

- ITNO Project Manager is tasked to oversee the operational support in coordination with UHPS.
- Ownership of project or tasks assigned by the Program/Business Owner (UH Public Safety/Command Center) belongs at the Tier One support level or in some cases Tier Two.
- Escalation to Tier Three Support belongs at Tier Two support level.
- Escalation to Tier Four Support belongs at Tier Three level.
6.0 **Spare Inventory**

A suggested parts inventory of spare camera, code blue phones, and alarm system components, compiled by ITNO AND UH Public Safety will be purchased by UHPS and maintained at ITNO Room 181. The UH tagging responsibility is borne by UHPS, however, ITNO will work in collaboration with UHPS to streamline and create efficiencies as necessary to ensure UH Tagging as required.

UH Public Safety in coordination with ITNO Project Manager will maintain a spare parts inventory as well as any associated equipment repair cost.
## 7.0 Roles, Responsibilities and Available Resources

<table>
<thead>
<tr>
<th>Area</th>
<th>Responsibility</th>
<th>Coordination</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Location of Cameras</strong></td>
<td>Public Safety</td>
<td>ITNO Project Manager</td>
</tr>
<tr>
<td><strong>Specification and Ordering Equipment</strong></td>
<td>Public Safety</td>
<td>ITNO Project Manager</td>
</tr>
<tr>
<td><strong>Camera Installation</strong></td>
<td>ITNO Project Manager – ITNO or Contractor</td>
<td>Construction and Facilities – Physical Plant</td>
</tr>
<tr>
<td><strong>Monitoring</strong></td>
<td>Public Safety COC</td>
<td>Other sites designated by Public Safety</td>
</tr>
<tr>
<td><strong>Monitoring of Network Devices</strong></td>
<td>ITAC</td>
<td></td>
</tr>
<tr>
<td><strong>Monitoring of Infrastructure in UHPS/COC</strong></td>
<td>Public Safety/COC</td>
<td>Other sites designated by Public Safety</td>
</tr>
<tr>
<td><strong>Repair of Technology Infrastructure</strong></td>
<td>Cameras, DVR, Switches Network – ITNO Head In Equipment VPR – Public Safety/COC</td>
<td>INTO Tech Project Manager, Network Analysts, Plan &amp; Design Team</td>
</tr>
<tr>
<td><strong>IT Network Design</strong></td>
<td>IT Network Design and Planning ITNO Network Analysts</td>
<td>Project Manager, Network Analysts, Plan &amp; Design Team</td>
</tr>
<tr>
<td><strong>Camera and DVR Configuration</strong></td>
<td>ITNO Camera Technician</td>
<td>ITNO Network Analysts</td>
</tr>
<tr>
<td><strong>Configuration of Network Infrastructure</strong></td>
<td>ITNO Network Analysts</td>
<td></td>
</tr>
<tr>
<td><strong>Configuration of Head In Equipment and Application Software</strong></td>
<td>Public Safety</td>
<td></td>
</tr>
<tr>
<td><strong>Repair and Installation of facilities infrastructure</strong></td>
<td>Electrical and Infrastructure repairs – UH Building Maintenance Cherry Picker Availability – Residential Life and Housing</td>
<td>Public Safety ITNO Project Manager</td>
</tr>
<tr>
<td><strong>Infrastructure Repair Command Center (COC)</strong></td>
<td>Public Safety</td>
<td>ITNO Project Manager</td>
</tr>
<tr>
<td><strong>Primary Contact for Repair Orders and Tracking</strong></td>
<td>ITNO 3-1411 Tracked in Anchor Point</td>
<td></td>
</tr>
<tr>
<td><strong>Performance Management</strong></td>
<td>ITNO will monitor MTTR</td>
<td></td>
</tr>
<tr>
<td><strong>Weekly Reports</strong></td>
<td>Public Safety/COC for repair and maintenance issues</td>
<td>ITNO Project Manager</td>
</tr>
<tr>
<td><strong>Monthly Reports</strong></td>
<td>ITAC – Network Connectivity Performance Reports ITNO – Number of tickets, MTTR, Recurring issues Public Safety – UHPS performance reports, Recurring Issues</td>
<td></td>
</tr>
</tbody>
</table>
8.0 Documentation and Submittals

Submit to UH Public Safety and ITNO shop drawings, product data required by the contract documents. Submit shop drawings, product data with such promptness and in such sequence as to cause no delay in the work or in the activities of separate contractors.

The Contractor shall provide a complete location table and spreadsheet indicating each security camera system component location including the following information: location of all installed components, landmark orientation and distance of security cameras from DVR/NVR location. The contractor shall be responsible for appending new installations to this documentation so that a complete, consolidated inventory of all installations and work completed by the contractor is maintained at all times.

By submitting shop drawings, and product data the contractor represents that the contractor has carefully reviewed and verified materials, quantities, field measurements, and field construction criteria related thereto. It also represents that the contractor has checked, coordinated, and verified that information contained within shop drawings, and product data conform to the requirements of the work and of the contract documents.

ITNO approval of shop drawings, and product data submitted by the contractor shall not relieve the contractor of responsibility for deviations from requirements of the contract documents, unless the contractor has specifically informed ITNO in writing of such deviation at time of submittal, and ITNO has given written approval of the specific deviation. The contractor shall continue to be responsible for deviations from requirements of the contract documents not specifically noted by the contractor in writing, and specifically approved by ITNO in writing.

ITNO approval of shop drawings, and product data shall not relieve the contractor of responsibility for errors or omissions in such shop drawings, product data, and samples.

ITNO review and approval or other appropriate action upon shop drawings, and product data is for the limited purpose of checking for conformance with information given and design concept expressed in the contract documents. ITNO review of such submittals is not conducted for the purpose of determining accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the contractor. The review shall not constitute approval of safety precautions or of construction means, methods,
techniques, sequences, or procedures. ITNO approval of a specific item shall not indicate approval of an assembly of which the item is a component.

Perform no portion of the work requiring submittal and review of shop drawings, and product data until UH Public Safety and ITNO has approved the respective submittal.

Submit shop drawings, product data, and samples as a complete set within thirty (30) days of award of contract.

General: Submit the following:

- ✓ Bill of materials, noting long lead time items
- ✓ Project schedule including all major work components that materially affect any other work on the project

Shop drawings: Submit the following:

- ✓ Backbone (riser) diagrams
- ✓ System block diagram, indicating interconnection between system components and subsystems.
- ✓ Interface requirements, including connector types and pin-outs, to external systems and systems or components not supplied by the contractor
- ✓ Fabrication drawings for custom-built equipment
- ✓ One set shall be laminated and placed in appropriate Telecommunication and Equipment Rooms.

Product Data -- Provide catalog cut sheets and information for the following:

- ✓ All system components
- ✓ Wire, cable, and optical fiber
- ✓ All metallic and nonmetallic raceways, including surface raceways, outlet boxes, and fittings
- ✓ Enclosures, racks, and equipment housings
- ✓ Over-voltage protectors
- ✓ Splice housings if applicable

Submit project record drawings at conclusion of the project and include:

- ✓ Approved shop drawings
- ✓ Plan drawings indicating locations and identification of all system components, telecommunication rooms, and backbone (riser) cable runs if applicable.
- ✓ Telecommunication and Equipment room termination detail sheets.
- ✓ Labeling and administration documentation.
- ✓ Warranty documents for all components and equipment.
✓ Coaxial, UTP, fiber optical, and power cabling certification test result printouts and compact discs.

8.1 Quality Assurance

The contractor shall be an authorized cabling and system installer. ITNO will provide a list of pre-approved contractors.

The contractor shall have worked satisfactorily for a minimum of five (5) years on systems of this type and size.

The contractor, upon request, by ITNO or UH Public Safety, shall furnish a list of references with specific information regarding type of project and involvement in providing of equipment and systems.

Material shall be new, and conform to grade, quality, and standards specified. Materials of the same type shall be a product of the same manufacturer throughout.

Subcontractors shall assume all rights and obligations toward the contractor that the contractor assumes toward the University of Houston and ITNO.

Quality Assurance inspections will be coordinated with ITNO Project managers and approved by UH Public Safety.

8.2 Warranty

Unless otherwise specified, unconditionally guarantee in writing the materials, equipment, and workmanship for a period of not less than fifteen (15) years from date of acceptance by ITNO and UH Public Safety for cabling.

8.3 Delivery, Storage and Handling

Protect equipment during transit, storage, and handling to prevent damage, theft, soiling, and misalignment. Coordinate with ITNO for temporary secure storage of equipment and materials during project timeframes. Do not store equipment where conditions fall outside manufacturer's recommendations for environmental conditions. Do not install damaged equipment; remove from site and replace damaged equipment with new equipment.

8.4 Sequence and Scheduling

Submit schedule for installation of equipment and cabling. Indicate delivery, installation, and testing for conformance to specific job completion dates. As a minimum, dates are to be provided for bid award, installation start date,
completion of station cabling, completion of riser cabling, completion of testing and labeling, cutover, completion of the final punch list, start of demolition, owner acceptance, and demolition completion.

8.5 Use of Site

Use of the site shall be at ITNO direction in matters which the University of Houston deems it necessary to place restriction. Access to building wherein the work is performed shall be as directed by ITNO.

The selected contractor temporarily will occupy the premises during the entire period of construction for conducting his or her normal business operations. Selected contractor will cooperate with the University of Houston and ITNO to minimize conflict and to facilitate non-disturbance of the University of Houston operations.

Proceed with the work without interfering with ordinary use of streets, aisles, passages, exits, and operations of the University of Houston to include ITNO operations.

All contractors will adhere to the University of Houston’s Contractor Badge Program and will wear assigned contractor’s badge on person in a clearly visible location following the Contractor Badge Program standards as administered and provided by Facilities Planning & Construction.

All contractors shall, when pulling cables in any University of Houston building or related off-site areas provide proper safeguards at the reel location. This can be done with personnel or appropriate safety barricades.

8.6 Service Continuity

Take no action that will interfere with, or interrupt, existing building services unless previous arrangements have been made with the University’s representative(s). The work shall be arranged to minimize down time. Should services be inadvertently interrupted, immediately furnish labor, including overtime, material, and equipment necessary for prompt restoration of interrupted service.

8.7 Deliverables

Submit project record drawings at conclusion of the project to include:

- Approved shop drawings
- Plan drawings indicating locations and identification of security camera system components, telecommunication rooms, and backbone (riser) and cable runs where applicable
• Labeling and administration documentation.
• Warranty documents for equipment.
• Copper certification test result printouts and diskettes.
• Optical fiber power meter/light source test results if applicable.
9.0 Inspection of Work

The installation company shall have an RCDD with Pelco Certification on staff and full-time during all phases of the installation to include testing and documentation.

The installer shall have a Pelco Certification in effect through installation, testing, documentation, and acceptance.

100 percent of on-site installation personnel shall be Pelco certified. At a minimum the contractor’s project manager or lead technician shall be BISCI certified to facilitate on-site inspection practices.
10.0 Approval and Acceptance

Final approval and acceptance of installed security camera systems will be at the discretion of UH Public Safety. Final approval and acceptance will be conditional on receiving of deliverables and a remote check of all system component functionality. ITNO will submit all deliverables to UH Public Safety.
11.0 **Budget and Billing Work Flow**

UH Public safety will maintain quarterly budgets for spare parts, repair of equipment and ordering of system components for projects to be estimated, installed and billed by ITNO with established billing procedures.

These procedures are for security camera/alarm systems, originating from UH departments and such work originating from departments require submission of an approved Work Request to ITNO Customer Services. Work emanating from an approved Work Request is billable to the departments.

1. Requestor (UH Departments) request security system estimate.
2. ITNO Project Manager does a Customer Needs Analysis
3. ITNO PM provides design to UH DPS for review
4. UH DPS approves design
5. IT Project Manager provides a quote and scope definition to Requestor
6. Requestor accepts quote
7. Requestor inputs an authorized ITNO Work Order
8. Communication Services enters a Project Work Order into AnchorPoint with two components:
   a. Parts
   b. Labor
9. ITNO Project Manager opens a ITI Procurement
10. ITI Procurement approved by Telecommunications Mgr. one of the MAC line item CF1’s.
11. UH ITNO procures parts
12. Work is preformed – Contractor for project installation
13. ITNO Project Manager closes work order with 5% IT Charges
14. ITBS receives Contractor invoices.
   a. ITI Forms created with AnchorPoint work orders.
   b. Telecommunications Mgr. approves using appropriate line item CF1.
   c. Contractor receives payment.
   d. ITBS sends information to CS to close the work orders, including P123.
15. Requestor receives telecom billing for P123 (labor) and P567 (parts)
12.0 Camera Model Specifications and Use Requirements

UH Department of Public Safety Use Requirements for camera deployments are defined in document G403006 SURVEILLANCE CAMERAS (Refer to Master Specification Section 28 23 00 for current camera specification) as follows:

1. Cameras at entrances and exits to the building shall show the faces of those exiting the building at 120 pixels per foot (ppf). Cameras in public hallways shall show an individual’s movement within the building.
2. Classrooms: Generally there will be no cameras in classrooms.
3. Research space: Cameras shall show persons exiting the research facility at 120 ppf. Cameras in the hallways shall show the movement of persons within the research facility. Cameras shall only be employed within the research spaces themselves only when there is a need to monitor the health and safety of the researchers.
4. Administrative space: Cameras shall be installed in the hallways and shall show movement of persons in the building.
5. Residential spaces: Cameras shall be located to show activity in the common areas, including lounges, laundry, computer labs, etc. No cameras shall be located within in the bedroom units.
6. Point-of-Sale and cashier areas: Cameras shall be located to show patrons’ faces at 120 ppf at the Point-of-Sale. Consult Owner Representative regarding use of security camera domes.
7. Surface parking lots and campus roadways: Cameras shall be located to show the description of the vehicles (color and make during daylight hours). Cameras shall show license plates of the vehicles at 60 ppf at parking lot entrances and exits.
8. Parking structures: Overview cameras shall show flow of traffic and vehicle descriptions. Cameras shall detect activity at parking gates and on parking levels. Cameras shall show license plates at 60 ppf at parking gates.

***Additionally, there is a requirement for a 30-day archive lifespan.

12.1 Deployment Applications and Pixels per Foot

The number of pixels per foot in a video frame helps determine the suitability of given camera model and its focal length for a specific situation. As a metric, pixels per foot serves as a minimum threshold for producing image resolutions capable of meeting a specific business need. Four general categories or levels of surveillance comprise the whole of security camera applications at the University of Houston. The ideal number of pixels per foot for each level of surveillance is affected by lighting conditions and the camera’s LUX rating.
Generally, the following guidelines should apply:

| Activity Detection (General Surveillance - the ability to recognize an event within the field of view) | 20 ppf day  
40 ppf night (*street lights etc) |
|-------------------------------------------------|----------------------------------|
| License Plate Reading                           | 60 ppf day   
80 ppf night |
| Recognition (Forensic Detail)                   | 80 ppf day   
100 ppf night |
| Identification (High Detail)                    | 120 ppf +    |

**12.2 PPF Camera Model and Focal Length Determination**

A camera’s ability to produce the minimum number of ideal pixels per foot is determined by its imager size (typically 4.8 mm); the distance of the camera from the area of interest; the total horizontal resolution the camera produces; and the camera’s focal length.

*** Lens Focal Length = Imager Size X Distance from the subject in feet X PPF 
Total Horizontal Resolution in Pixels

**Pixel Rating Horizontal Resolution Chart**

<table>
<thead>
<tr>
<th>Megapixel Rating</th>
<th>Horizontal Resolution</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5</td>
<td>800</td>
</tr>
<tr>
<td>1.3</td>
<td>1280</td>
</tr>
<tr>
<td>2.0</td>
<td>1632</td>
</tr>
<tr>
<td>3.0</td>
<td>2048</td>
</tr>
<tr>
<td>4.0</td>
<td>2272</td>
</tr>
<tr>
<td>5.0</td>
<td>2592</td>
</tr>
</tbody>
</table>

*slight variations based on camera manufacturer and image collector size

** Megapixel rating is the horizontal sensor count multiplied by the vertical sensor count and then divided by 1 million.
12.3 Deployment Applications and Frame Rates

As image quality and frame rate increase, so do bandwidth and storage requirements. The frame rate selected must meet the business requirements, but it does not need to be higher than what is required.

Industry Guidelines (source: IP Video Market)

<table>
<thead>
<tr>
<th>Application</th>
<th>Frame Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash register, teller stations</td>
<td>12 to 15 fps</td>
</tr>
<tr>
<td>License Plates</td>
<td>10 – 15 fps</td>
</tr>
<tr>
<td>School or office hallways</td>
<td>5 fps</td>
</tr>
<tr>
<td>Parking lots, traffic cameras, overview scenes</td>
<td>1 to 3 fps</td>
</tr>
<tr>
<td>Sports Stadiums on non-event days</td>
<td>1 fps</td>
</tr>
</tbody>
</table>
13.0 **Guidelines for Alternative Camera Selection Process**

Alternatives to University of Houston Information Technology approved security camera models will be considered on a per project basis if there is a clear though currently undefined business need that is not supported by either Pelco or Scallop. All cameras being considered must be thoroughly tested within the UH infrastructure and must meet minimum criteria for UIT acceptance.

Acceptance of an alternative camera manufacturer’s products will be determined by the following:

1. Functional and feature compatibility with the adopted Network Video Recorder (Currently Strand P6 or P8)
2. The company’s reputation for quality and customer support
3. Turn around times for parts replacements
4. The camera’s LUX rating
5. The camera’s ability to support motion recording
6. The camera’s storage and bandwidth requirements
7. The camera’s ability to meet the business requirement.
8. Price point and cost of ownership

Recommendations for cameras that are not project dependent will be reviewed on a low priority basis.

No test cameras will be deployed unless approved for testing by UH IT.
14.0 Camera Installation Requirements

14.1 IP Camera Power Source Preferences

1. PoE switch ports
2. Power Injectors
3. AC adaptors

14.2 External Camera Lightning Protection

1. External cases will be grounded
2. Cameras will be mounted to their cases using nylon washers
3. All cables must incorporate surge protection such as DTK-MRJPOE for PoE cables or applicable alternatives designed to protect network switches, NVRs/DVRs.

14.3 Camera and IDF Cable Labeling
15.0 Network Video Recorder Requirements

1. H.264 compliance
2. Ability to support motion recording in Pelco cameras (Strand will meet this requirement in June, 2012)
3. Ability to support Scallop cameras (Strand will meet this requirement by March 2012)
4. Access to multiple NVRs through a single interface
5. Tiered access rights
6. Access priority rights
7. Ability to support matrix views
8. Gigabit uplinks
9. Ability to export snapshots and video clips

15.1 Server Network Requirements

1. All NVR servers should be connected to a distribution switch
2. All NVR servers will be connected to a gigabit port.
Appendix A – Approved Manufacturers

Cameras, DVRS and NVRS
Pelco Analog Cameras and DVRs
Scallop Panoramic Cameras
Pelco IP cameras (including IR cameras)
Strand NVRs
Pelco Digital Sentry NVR

Alarm System Components
Digital Security Controls

For cabling and hardware specs see UH Cabling Standards:

## Appendix B – Approved Part Listing

<table>
<thead>
<tr>
<th>Part</th>
<th>Manufacturer / Product Lines</th>
<th>Application - Model Choice</th>
</tr>
</thead>
<tbody>
<tr>
<td>IP Security Camera</td>
<td>Pelco / SUREVISION Sarix IX Series Sarix IM-E Series Environmental Sarix IM-V Vandal Resistant Sarix IM Mini Domes</td>
<td>APPLICATIONS: Activity Detection; License Plate Reading; Recognition; Identification. Model appropriateness depends on the camera’s ability to provide adequate Pixels per Foot (PPF)</td>
</tr>
</tbody>
</table>
|                     | INDOOR FIXED DOME Sarix ID Indoor Domes Sarix IM Vandal Resistant Sarix IM Mini Domes Camclosure IP Fixed IP Dome | MODEL SELECTION: Specific models are based on business use requirements as determined by the business owner – The University of Houston Department of Public Safety. The University of Houston Information Technology Operations Group will select the appropriate model to meet these requirements. The model selection process is based on the following criteria:  
  - PPF – Pixels per foot  
  - Lighting conditions  
  - Environmental Variables  
  - Analytics requirements  
  - Network Impact |
<p>|                     | OUTDOOR FIXED DOME Sarix IE Environmental Sarix IM Environmental Mini Dome | |
|                     | PTZ DOME Spectra HD Spectra IV H.264 Spectra IV IP Spectra Mini IP | |</p>
<table>
<thead>
<tr>
<th>Specialty Camera (Infrared IP Camera)</th>
<th>Pelco</th>
<th>License Plate Readers; Confined areas under very low light.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Panoramic IP</td>
<td>Scallop</td>
<td>D7 180</td>
</tr>
<tr>
<td></td>
<td></td>
<td>***Consult with the UH IT Network Operations Video Analyst and the UH DPS Manager of Public Safety Systems for final design approval. – day time color best suited for indoor with consistent ambient lighting. Suited for Activity Detection in wide open spaces. (does not support motion recording)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>M6-200 – day/night black and white with exceptional detail in low lighting conditions. Suited for Activity Detection in wide open spaces. (does not support motion recording)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>***Consult with the UH IT Network Operations Video Analyst and the UH DPS Manager of Public Safety Systems for final design approval</td>
</tr>
<tr>
<td>Category</td>
<td>Brand</td>
<td>Additional Information</td>
</tr>
<tr>
<td>-------------------</td>
<td>----------</td>
<td>----------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Analog Camera</td>
<td>Pelco</td>
<td>***Consult with the UH IT Network Operations Video Analyst and the UH DPS Manager of Public Safety Systems for final design approval</td>
</tr>
<tr>
<td>DVR</td>
<td>Pelco</td>
<td>***Consult with the UH IT Network Operations Video Analyst and the UH DPS Manager of Public Safety Systems for final design approval</td>
</tr>
</tbody>
</table>
| NVR               | Strand   | NVR P-6  
NVR P-8  
NVR E-24  
NVR E-32  
Pelco Digital Sentry NVR  
***Consult with the UH IT Network Operations Video Analyst and the UH DPS Manager of Public Safety Systems for final design approval |
| Cable Video       | Commscope| Cat 6 Indoor  
Flooded Cat6 Outdoor |
<table>
<thead>
<tr>
<th>Part</th>
<th>Manufacturer - **Application</th>
<th>Description/Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cable Video</td>
<td>Commscope</td>
<td>Cat5e Indoor</td>
</tr>
<tr>
<td>Power cables</td>
<td></td>
<td>Flooded Cat5e Outdoor</td>
</tr>
<tr>
<td></td>
<td>Lake</td>
<td>Low Voltage 18-2</td>
</tr>
<tr>
<td></td>
<td>Lake</td>
<td>High Voltage 16-2</td>
</tr>
<tr>
<td>Emergency Phones</td>
<td>Code Blue</td>
<td>CB1e – Tall Pedestal</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CB1wb – W/L Tall Pedestal</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CB2e – Wall mountable</td>
</tr>
<tr>
<td>Alarm Systems</td>
<td>Digital Security Controls</td>
<td>See Below</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Part</th>
<th>Manufacturer</th>
<th>Description/Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>T-Link TL250</td>
<td>DSC</td>
<td>T-Link Starter Kit</td>
</tr>
<tr>
<td>LCD Keypad</td>
<td>DSC</td>
<td>PK 5500</td>
</tr>
<tr>
<td>Zone Expander Card</td>
<td>DSC</td>
<td>PC 5108</td>
</tr>
<tr>
<td>Accessory Kit</td>
<td>DSC</td>
<td>Accessory Kit</td>
</tr>
<tr>
<td>Power Adapter / ACCK 1</td>
<td>DSC</td>
<td>PTD164DU-CC</td>
</tr>
<tr>
<td>Wireless Receiver</td>
<td>DSC</td>
<td>RF 5132-433</td>
</tr>
<tr>
<td>Panic Buttons Wireless</td>
<td>DSC</td>
<td>WS 4938 – One Button</td>
</tr>
<tr>
<td>Panic Buttons Hardwire</td>
<td>DSC</td>
<td>HUB-25A</td>
</tr>
<tr>
<td>Motion Detectors</td>
<td>DSC</td>
<td>EC – 300D</td>
</tr>
<tr>
<td>Wireless Receiver Card</td>
<td>DSC</td>
<td>PC 5320 Multiple Rcv Card</td>
</tr>
<tr>
<td>Door Contact</td>
<td>DSC</td>
<td>SM35W Surface Mount</td>
</tr>
<tr>
<td>Door Contact</td>
<td>DSC</td>
<td>DC 1641 W Flush Mount</td>
</tr>
<tr>
<td>Door Contact</td>
<td>DSC</td>
<td>OCD59A Overhead Door</td>
</tr>
<tr>
<td>Cable</td>
<td>Lake</td>
<td>P224C 22 AWG 2pr Plenum</td>
</tr>
<tr>
<td>Cable</td>
<td>Lake</td>
<td>P224C-09 22 AWG 4Pr Plenum</td>
</tr>
</tbody>
</table>

For cabling and hardware specs see UH Cabling Standards:

UH Security Systems Service Workflow

**Tier 1 Support**
- ITNO Technicians
  - ITNO Customer Service Dispatch ITCS Technician
  - ITNO Technician Diagnostics
  - Problem Fixed
  - YES
  - Repair Done Parts In Stock CTS 181
  - 1

**Tier 2 Support**
- Network Analyst
  - Network Analysis
  - Access Distribution
  - Problem Fixed
  - YES
  - 1

**Tier 3 Support**
- Vendor/Supplier/Contractor
  - ITNO Technician Requests Project Manager
  - Project Manager Contacts Vendor/Supplier IT/Tech Support
  - Delivery Schedule
  - Problem Fixed
  - YES
  - 1

**Work Request Completed**
- Work Request completion
- ITNO Close Work Request UH IT/NO Tech UH IT/NO PM
- Replenish Parts Stock CTS 181 ITNO PM From ITNO Tech
- UH PS Command Center Update Chief’s Weekly report ITAC

It must be noted that shipment and return of parts are 2-5 business days.