5.11 EVALUATION OF VIDEO ASSESSMENT SYSTEMS

The following parameters determine the effectiveness of a video assessment subsystem:

- minimum time between sensor alarm and video display
- complete video coverage of the sensor detection zone (called the assessment zone when sensors and video are integrated)
- ability to classify a 1 ft. (0.3 m) target at the far edge of the assessment zone (Classification means an object in the video image can be accurately differentiated as human, animal, blowing debris, or other category. Some protection systems must identify the object in the image; identification is the ability to differentiate between people, for example, John not Jim. These capabilities are a function of image quality, which is measured using video resolution.)
- vertical field of view at far edge of exterior detection zone to account for the height of a standard fence (if present) and a person climbing over the top of the fence
- continuous operation, 24/7
- minimal sensitivity to environmental conditions for all cameras
- minimal obscuration of the assessment zone (such as trees, fences, or junction boxes in exterior areas or furniture that blocks the camera view in interior areas)
- camera field of view and video recording system integration that displays the alarm source to an operator

The more the assessment subsystem deviates from these requirements, the lower the quality of the video image and the more subsystem performance will be degraded.

Evaluation of video surveillance systems generally verifies that cameras and pan/tilt/zoom controllers are operational and that time/date stamps or other text messages are accurate.

To support testing of the video subsystem, test targets can be used to verify video image quality. These targets are simple geometric shapes that include a 1 ft. (0.3 m) diameter circle, a 1 ft. square, and a 1 ft.-high triangle. The test target sizes are based on a horizontal field of view of six horizontal television lines (HTVL) per foot as the required resolution, which is sufficient to classify a crawling intruder under appropriate lighting. If the expected threat will always provide a larger profile to the video system, a lower horizontal resolution is acceptable. Using the test targets is appropriate in both cases. The test targets are painted black on one side and white on the other so they can be used to check image resolution in dark and bright spots, respectively. Because the evaluation must consider component performance under a variety of changing conditions, this is a simple way to test whether the

test targets can be seen at lighting extremes in the area. These targets are used for testing both black-and-white and color cameras.

The targets are placed at various points in assessment zones (or across the camera field of view, if using a surveillance system), and the subsystem operator is asked to distinguish the different targets. The more targets that can be clearly differentiated, the more confidence one can have in the quality of the video image. Locations selected for testing are those that do not appear to make target identification easy, such as dark or bright spots or places where the camera view is obstructed or where the surface may not be level. The tests can be performed for both exterior and interior cameras. These targets test the extremes of the black and white capabilities of the assessment subsystem against the background color the assessment zone. Other aspects of video image quality that must be considered are lighting, camera mounting, the transmission system used, and the integration of switchers and controllers into the subsystem to facilitate alarm assessment.

The test targets are also used to check far-field resolution, particularly in exterior assessment zones. Because the far field represents the furthest distance from the camera, it will have the fewest lines per foot, so this is a quick way to verify that the horizontal resolution is maintained across the entire assessment zone.

Quality of the live video image is just one aspect of the evaluation. Because it is unlikely that all alarms can be assessed using live video (think of multiple alarms, operator attention to other tasks when an alarm is initiated, or an adversary running very fast through a detection zone), a video recording and storage system is also needed. As with cameras, there are many choices to accomplish this, but what is important is that the recording and playback happens fast enough and with enough detail to determine the cause of the alarm. Speed of playback and display is less important when the response will be after-the-fact review, as long as the image quality is sufficient to assess the alarm. The video test targets can be used to verify image quality for recorded images. It is likely that the recorded image will not have the same resolution (i.e., quality) as the live image, but that varies with different recording media and settings.

The test targets may also be used to test video surveillance systems. In this case, video image quality can be tested, although these systems depend on human operators to actually see a security event occurring in a live view, or assume that a delayed response using recording is all that is needed. If this approach will work for the facility, the test may be appropriate. In addition, many video surveillance systems use pan-tilt-zoom (PTZ) cameras and so may not be viewing an area of suspicious activity.

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