Test Scenario 9 – Close Range Surprise Encounter

This scenario was developed to determine the ability of the user to determine the threat level of a subject encountered by surprise in an environment with very little ambient lighting. It is important for an officer to quickly determine if a threat exists and needs to be engaged with deadly force. Mistaken identity shootings occur too often when an officer believes a subject is armed and it turns out they had something else in their hand. This scenario has the officer walking around a corner and being confronted by an individual.

The first photo shows the subject holding a cell phone in his right hand. It is readily identifiable and would be a no-shoot situation. The second photo shows the same subject with a pistol in his hand. This is also easily identified. The bright images show all details.
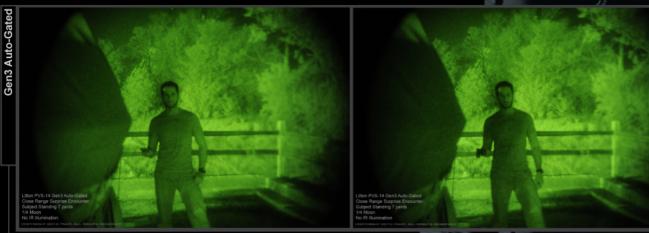

At close range, the built-in IR illuminator flattens some of the background foliage. The subject is clearly identified. The only real difference is that the subject's eyes are reflecting the IR light. Both the cell phone and gun are easily identified.
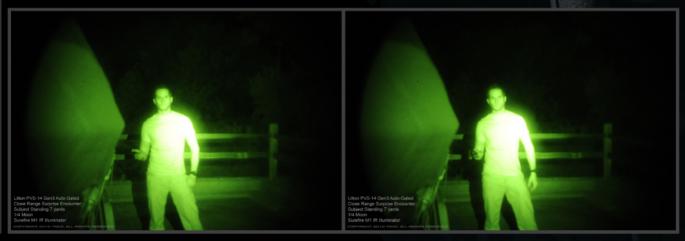

The Surefire M1 is almost too bright for this application. The heavy illumination bounces of the subject's clothing, eliminating details of his shirt. The subject's facial features are easily recognized along with the cell phone and pistol. Note how the IR light tends to focus on the subject and the background foliage goes dark. At this distance, the illuminator actually somewhat hampers the user's situational awareness.

Litton PVS-14 Gen3 Auto-Gated
Close Range Surprise Encounter
Subject Standing 7 yards
1/4 Moon
No IR Illumination

Litton PVS-14 Gen3 Auto-Gated
Close Range Surprise Encounter
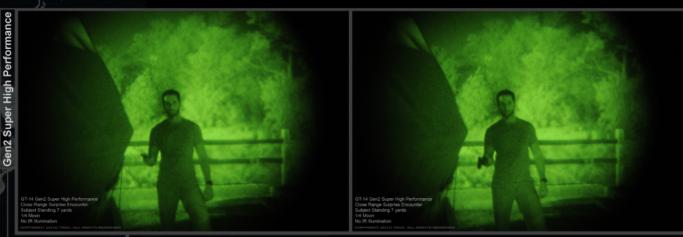Subject Standing 7 yards
1/4 Moon
No IR Illumination

As with the PINNACLE unit, the Litton Gen3 Auto-Gated tube clearly shows the subject and identifies the cell phone of the pistol. The image is slightly darker than the PINNACLE unit, but still readily useable.

Litton PVS-14 Gen3 Auto-Gated
Close Range Surprise Encounter
Subject Standing 7 yards
1/4 Moon
Internal IR Illuminator

Litton PVS-14 Gen3 Auto-Gated
Close Range Surprise Encounter
Subject Standing 7 yards
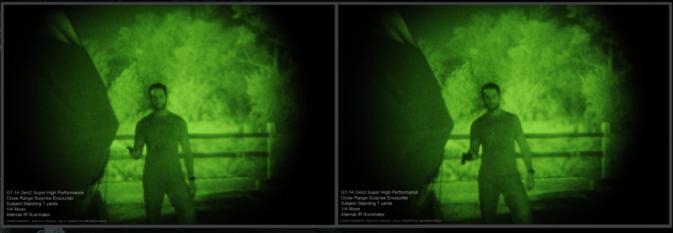1/4 Moon
Internal IR Illuminator

Again, the built-in IR illuminator does little more than flatten some of the contrast in the images. The subject's eyes reflect the IR light. The objects in his hands are easily identified.

Litton PVS-14 Gen3 Auto-Gated
Close Range Surprise Encounter
Subject Standing 7 yards
1/4 Moon
Surefire M1 IR Illuminator

Litton PVS-14 Gen3 Auto-Gated
Close Range Surprise Encounter
Subject Standing 7 yards
1/4 Moon
Surefire M1 IR Illuminator

The Surefire M1 focuses the IR light on the subject, creating a hot spot on the torso. The image is not as bright as the PINNACLE, which causes a little less recognition of the hands. The cell phone is harder to read compared to the pistol.
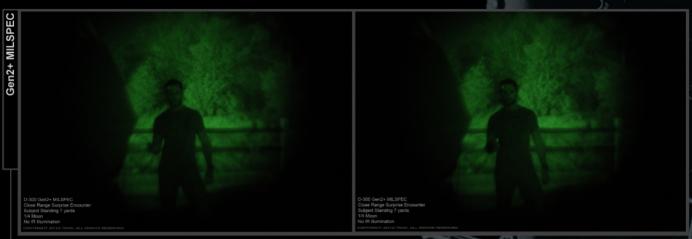
The subject can be clearly acquired. However, the lower resolution causes the cell phone or pistol to be identified by shape rather than detail. That said, the gun is still easily resolved and a quick shoot/no-shoot determination can be made.
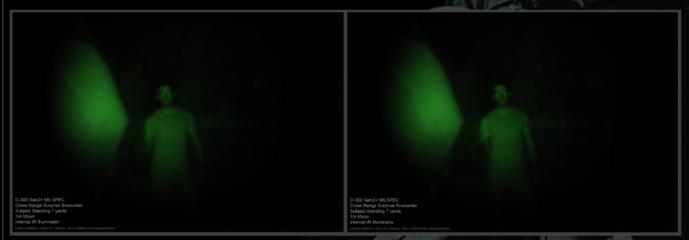

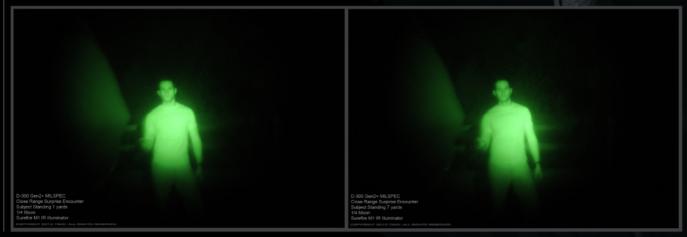The built-in IR illuminator did not add any value to the image.

The Surefire M1 blooms considerably at this range. The surrounding details begin to fade, but the subject's hands are still quite visible. The loss of resolution in the Gen2 SHP tube begins to show.

D-300 Gen2+ MILSPEC
Close Range Surprise Encounter
Subject Standing 7 yards
1/4 Moon
No IR Illumination
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D-300 Gen2+ MILSPEC
Close Range Surprise Encounter
Subject Standing 7 yards
1/4 Moon
No IR Illumination
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The Gen2+ tube really struggles with the lack of ambient light. The silhouette of the subject can be made out against the lighter background, but details are not available because of the Gen2+ tube's poor light gathering ability. The subject is obviously holding something in his right hand, but the object cannot be resolved. This situation could result in catastrophe because rapid shoot/no-shoot response cannot be made.

D-300 Gen2+ MILSPEC
Close Range Surprise Encounter
Subject Standing 7 yards
1/4 Moon
Internal IR Illuminator
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D-300 Gen2+ MILSPEC
Close Range Surprise Encounter
Subject Standing 7 yards
1/4 Moon
Internal IR Illuminator
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The built-in IR illuminator aids in creating detail in the subject's face and shirt because they are lighter color and soak up most of the light. The subject's hands and the surrounding area are almost completely blacked out. Again, this creates danger because the presence of a threat is not immediately identified.

D-300 Gen2+ MILSPEC
Close Range Surprise Encounter
Subject Standing 7 yards
1/4 Moon
Surefire M1 IR Illuminator
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D-300 Gen2+ MILSPEC
Close Range Surprise Encounter
Subject Standing 7 yards
1/4 Moon
Surefire M1 IR Illuminator
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The additional higher-power illuminator provides more definition to the subject. While the IR light seemed to wash out the subject in the other devices, the Gen2+ tube cannot gather nearly as much light. The low resolution makes features appear fuzzy. The Gen2+ tube can only focus on the exact area of IR illumination, so the hands fall off the image. Even with the Surefire M1, the presence of a threat cannot be determined.

ATN Gen1+ Viper
Close Range Surprise Encounter
Subject Standing 7 yards
1/4 Moon
No IR Illumination
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ATN Gen1+ Viper
Close Range Surprise Encounter
Subject Standing 7 yards
1/4 Moon
No IR Illumination
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The Gen1+ unit does not have enough light to create any image. The subject and surrounding environment cannot be seen.

ATN Gen1+ Viper
Close Range Surprise Encounter
Subject Standing 7 yards
1/4 Moon
Internal IR Illuminator
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ATN Gen1+ Viper
Close Range Surprise Encounter
Subject Standing 7 yards
1/4 Moon
Internal IR Illuminator
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The built-in IR illuminator did not add any value to the image.

ATN Gen1+ Viper
Close Range Surprise Encounter
Subject Standing 7 yards
1/4 Moon
Surefire M1 IR Illuminator
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ATN Gen1+ Viper
Close Range Surprise Encounter
Subject Standing 7 yards
1/4 Moon
Surefire M1 IR Illuminator
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The additional higher-power illuminator at least allows the subject to be seen through the Gen1+ device. Resolution is poor and facial features are somewhat obscured. The subject's hands cannot be seen, so it is unknown whether or not a threat exists.

Conclusions

Based on the test data documented above, it is the authors' professional recommendation that only Gen3 night vision, such as the ITT PVS-14 Gen3 PINNACLE Auto-Gated Night Enforcer or the Litton Gen3 Auto-Gated PVS-14) be utilized for domestic law enforcement and homeland security taskings.

This conclusion is based on the need for responders to be able to identify threats rapidly in reasonable circumstances, with a high degree of probable accuracy. Data clearly illustrates the short-comings of the Gen1 and Gen2 image intensifier tubes. While sufficient for hobbyist application, LE work requires a much higher level of performance. The lack of brightness and resolution found in the Gen1 and Gen2 tubes isolates the operator from his surroundings. Situational awareness is severely compromised. As seen in the photos, the lower-end tubes produce very dark images that keep the user from seeing the environment. They had a hard time identifying the subject, let alone any other possible threats. With today's advances in night vision technology, there is no reason for a professional to settle for lesser performance.

IR illuminators should be taken into account when reviewing the images. In some instances, an IR illuminator was absolutely required for the night vision device to resolve an image. Today, criminals are acquiring night vision as well. While IR illuminators are able to drastically improve the image, anyone else looking through night vision sees them too. So, a constantly active IR illuminator is akin to a big bullseye on the officer's head to anyone else observing them through night vision. Suffice to say an image intensifier that requires an active IR illuminator to produce a useable image should be avoided.

Night vision devices are not magic. They greatly enhance the operational capabilities of the modern law enforcement professional, but they have limitations. As seen in the first scenario (residential basement with no ambient light), even the latest generation image intensifier was rendered practically useless without artificial infrared light. Once the illuminator was activated, the Gen3 devices produced obviously superior images. But, the illuminator was required in that environment. Professionals need to constantly train with their night vision devices to maintain proficiency and be aware of their limitations.

The images presented here do a good job of illustrating the capabilities of the various devices. However, it should be noted that photographic representation of night vision images is never completely accurate and always reproduces a slightly degraded quality. While these images are close, the operator's view will always be better.

Another subject worth mentioning is the quality of the optic being purchased. Regardless of the tube's capabilities, the system still has to function. We should note the ATN Viper's built-in IR illuminator did not work out of the box. It is evidenced by the photos, that a Gen1 tube requires an IR illuminator to provide any kind of useable image. The built-in illuminator required us to turn on and off the system several times before it would function. After that, it would only work intermittently.

Night vision represents a critical component of an officer's ability to meet and engage today's threats. Law Enforcement officers, departments, units, and agencies need to be well aware of the technology's capabilities and limitations when employing night vision in a social setting. They also need to be well aware of the various levels of technology available when making purchase decisions.