JULIO A. SANTIAGO
DEPUTY SHERIFF

ELLIEL F. KNUTSEN
POLICE SERGEANT

NITE-SITE, INC.

P.O. BOX 0
ROSEMOUNT, MINNESOTA 55068

DAY NIGHT
COMBAT SIGHTING SYSTEMS

4163

November 22, 1978

Radioisotopes Licensing Branch
Division of Fuel Cycle & Material Safety
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Subject: Quarterly Report - July, August and September, 1978.

Reference: N.R.C. Licenses, 22-13585-01, 22-13585-02, 22-13585-02C.

The third quarterly report of Promethium-147, installed into gun sights, are as follows:

Model 70-H sets, 114.
Activity: 1.5 mCi Pm-147 per set.
Radiation levels: <0.5 mr/hr at 1 cm.
Wipe test: <0.0005 µCi removable activity.

Model 70-S units, 18.
Activity: 0.8 mCi Pm-147 per unit.
Radiation levels: <0.5 mr/hr at 1 cm.
Wipe test: <0.0005 µCi removable activity.

Sights returned for disposal: None.

Signed certifications on above are on file, together with all required names, departments and addresses, for your inspection.

Sincerely,

Elliel F. Knutsen

Elliel F. Knutsen
Director/Licensing
Nite-Site, Inc.

9106200300 910509
PDR FOIA
BAZZANE90-504 PDR

DEC 12 1978

11/27/78 9105200300

E/21

Developed by Law Enforcement Officers . . . . . For Law Enforcement Officers

1/24/79

ROYAL CANADIAN MOUNTED POLICE

CRIME DETECTION LABORATORY

BOX 6500

REGINA, SASKATCHEWAN

S4P 3J7

NITE-SITE

EVALUATION REPORT

BY

A. J. SOMERS

R.C.M. POLICE

SMALL ARMS TRAINING STAFF

6/22

11/24/79

One of the major problems in the use of firearms is to get the bullet or projectile on to the target. To do this there has been developed, over many centuries, various types of sighting arrangements. In the main these fell into two major catagories, namely the tangent sight and the received or aperature sight with many variations and modifications. About the time of the American Civil War optical or telescopic sights came into use and today these have become very popular. Along with increasing the 'point-blank' range they give clarity in the target area, increase target size and in the twilight zone give greater light gathering ability, permitting shots not possible with the standard iron sight. In twilight areas it can be appreciated that is most difficult to resolve black sights against a dark target and of course in complete darkness nothing was of value until the American Armed Forces developed night viewing devices.

The first of these was an infra-red light mounted on a rifle along an optical reader. It had two disadvantages, the first of which was the fact that the light source was visible when viewed straight on and the second was that it did not take long for opposing forces to develop their own scanners to search out the sniper using this device Subsequent to the development of the infra-red sighting system, another system utilizing an electronic light intensifier has been developed. This system eliminated the problem of opposing forces being able to see the red light when viewed straight on, and detection by scanners became virtually impossible. Several other problems, however, limit greatly the practical use of this system. Size and weight

may be a problem if the user is required to locate on a point of limited accessability or space. The system is relativoly fragile and prone to malfunctions with no greater shock to absorb than the recoil of the weapon on which it is used. Thirdlv the lense must be focused for every specific range and adjustment of the focusing lense changes the point of impact relative to cross hair position. Accurate fire at any range except that for which it has been sighted is impossible. These problems tend to detract from the functional efficiency of this system to the point where it is restricted to being an observation device.

Within recent years an alternate sighting system has been developed which would seem to overcome most of the problems encountered by the sophisticated and expensive electronic ligh: gathering or infra-red sighting systems. Referred to as the Day/Night Combat Sighting System it was developed by Nite-Site Inc., of Rosemount, Minnesota, U.S.A., and has been found to be an effective and inexpensive means of greatly increasing hit probabilities during the twilight or low level light periods.

This sighting system is designed to replace, attach to or integrate into existing sighting arrangements on standard Police firearms. It consists of a self luminous front dot along with a similarly self luminous rear bar. The evoluation of this Day/Night sighting system has as its criterion:

1. No change in weapon weight.
2. No change in weapon balance.
3. No change in weapon dimensions.
4. No requirement for a power source.
5. No change in Day/Night point of impact.
6. No Day/Night switch over requirement.
7. No moving parts.
8. No danger to user.
9. Bright sighting picture in all light conditions.

Components are moulded from high strength polycarbenate or investment cast or machined from steel. There is no reason to believe that these components are any more fragile than original equipment, although no destructive tests have been carried out by the writer.

The self luminous portion of sighting system consists of the radioactive element Promethium (PM 147) mixed with a phospher and encapsiolated in an epoxy.

The potential radiation hazard, should the device be accidentally or deliberately abused, is negligable since the weak beta particles from the PM 147 would appear to be adequately shielded by only a few millimetres of plastic. The epoxy encapsulation would appear to eliminate any potential hazard should the radio luminescent material be accidentally or deliberately ingested.

Hitting a target in total darkness is not a problem for a combatant since during such conditions, the target would not be visible. However, neither a total darkness situation nor the ideal lighting condition are likely to be in existence when a policeman is required to use hand held weapons against personnel targets. A typical police combat situation would probably be in a low light level area where standard iron sights would be virtually useless as a tool to direct aimed fire. It is in this and similar situations that the Day/Night system is designed to give the policeman a decided advantage in delivering quick accurate fire to a target partially obscured by darkness. The sighting system which, in ideal lighting conditions, is virtually identical to factory original, becomes a glowing round dot at the front and glowing bar at the rear. With these components alligned so that the front dot is located immediately above the rear bar, aimed fire can be directed at even a moving target.

Before light level deteriorates to the point where conventional iron sights are not useable, the Day/Night sight dot and bar begin to show their pale green luminescence. This does not tend to distract or impede the shooters ability to obtain as clear a sight picture as existing light would permit. As the light level decreases and conventional lights become less visible, the shooter is inclined to automatically depend on the luminescent dot and bar for his sighting picture.

The Day/Night sighting system is available for virtually any police hand or shoulder weapons in use today. Installation requires no gun smithing

experience and all necessary parts are included in the sight package.

In summing up the results of these tests, which may not be conclusive for every combat situation, it could be said that the Nite-Site Day/Night Combat Sighting System gives the policeman the ability to direct accurate, aimed fire at a target, which he could not otherwise hope to hit, in the combat conditions he will most frequently encounter.