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NMED 000295

## REPORT OF PERSONNEL CONTAMINATION INCIDENT

NeoRx Corporation, May 2, 2000

### Summary

An employee was contaminated with very small droplets (9-19 microns, estimated) of high concentration Holmium-166. Decontamination efforts were only partly successful. Contamination levels were monitored and skin doses calculated. The maximum skin dose was calculated to be 42 rem or less (84% of the dose limit). Whole body measurements did not reveal any internal contamination. *Annual exposure limits were not exceeded.*

The immediate cause of this incident appears to be improper use of safety equipment.

The recommended corrective action is to:

- increase the supervision of less experienced workers
- insist on the use of all engineering and process controls
- suspend the affected employee from working with radioactivity for the calendar year.

### Description of Incident

At approximately 1400, airborne droplets contaminated a manufacturing engineer who was withdrawing a needle from a vial containing Holmium 166 Chloride.

### Immediate Actions Taken

- The engineer immediately surveyed himself with a contamination survey instrument which was in the area, removed his contaminated gloves, and called for assistance.
- At 1410 hr he began washing his hands with RadCon, a commercial decontamination agent
- When help arrived, his contaminated protective clothing was removed, he was surveyed and decontamination efforts moved to his face, where contamination had been detected
- D Salmon was contacted in Idaho by the NeoRx RSO at 1440. Readings in cpm were relayed and an initial skin dose estimate was made that indicated that a dose near the annual limit might be received at the current levels of contamination. Salmon emphasized that the dose appeared to be well below the threshold for skin injury.
- Nasal swabs and sputum and urine samples were taken and analyzed in a gamma counter. A whole body count was taken with a 2"X2" NaI detector and multichannel analyzer at a distance of one meter.
- At 1500 hr contamination efforts were no longer resulted in reduced readings from the survey meter. Strategies for further decontamination were discussed. Salmon advised that harsher methods should only be used under a physician's supervision and suggested transporting the engineer to the University of Washington Medical Center, where additional monitoring could be done and physicians and health physicists were available. NeoRx agreed to this course of action and Salmon contacted J Johnson, UWMC health physicist, and asked her to monitor the patient and to ask for the assistance of the UWMC nuclear medicine department, which has experience in precisely quantifying Ho-166 in humans.
- At UWMC the patient was put in the care of J Rajendran, MD, a nuclear medicine physician experienced with the use and dosimetry of Ho-166. J Johnson provided health physics advice

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of 15 cm<sup>2</sup>, 1 cm<sup>2</sup>, and for a point source. The doses, averaged over 1 cm<sup>2</sup> were, 2.55 rads, 35.4 rads, and 35.4 rads. Hand calculations were done and were consistent with results from VARSKIN.

Assuming that the initial activity was 10 times as high and in the form of a point source, and the contamination was reduced uniformly over one hour, the dose in the first hour was calculated by VARSKIN MOD 2 to be 5.2 rads, for a total estimated dose of 8 - 42 rem.

This individual's shallow dose for 1999 was 680 millirem.

Internal contamination was not measurable. The Annual Limit of Intake for this nuclide is 2000 uCi.

### Conclusion

Skin dose 8 - 42 rem (16% - 84% of limit). No significant internal dose.

By

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