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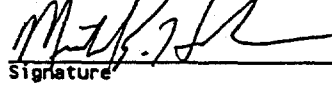
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7. Abstract

Position Paper to develop and document a position on the decision not to acquire continuous air monitors (CAM's) from government excess/surplus supplies.

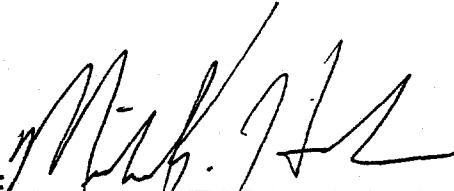
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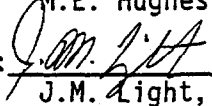
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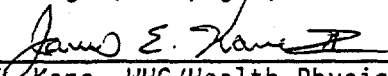
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Position Paper
Project W236A
Multi-Function Waste Tank Facility
Continuous Air Monitor (CAM) Acquisition
Recommendation

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**Position Paper
Project W-236A
Multi-Function Waste Tank Facility
Continuous Air Monitor (CAM) Acquisition
Recommendation**

1.0 PURPOSE

The purpose of this position paper is to document the decision not to acquire continuous air monitors (CAM's) from government excess/surplus supplies.

2.0 Background

The procurement plan for equipment to be acquired for project W-236A, the Multi-Function Waste Tank Facility (MWTF), stipulates that radiation monitoring equipment will be supplied by WHC via the stock retained within the excess/surplus inventory or utilization of procured instruments from canceled projects.

3.0 Discussion

Continuous air monitors (CAM's), manufactured by Eberline Inc., are utilized to sample the air for detection of radiological alpha and beta particulate. Once their presence is detected the monitor will alarm to alert personnel. The Health Physics organization currently uses the Model ALPHA-5A for alpha detection and the Model AMS-3A for beta detection. These instruments have been considered effective methods of air monitoring but, with increasing technological advances, are becoming obsolete. Eberline Inc. has introduced upgraded replacements of these CAM's and presently the Health Physics organization has initiated a gradual implementation of the

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updated models. The new generation of CAM's, manufactured by Eberline, are Model ALPHA-6 and AMS-4.

4.0 Technological Comparison

Several significant upgrades/improvements are emphasized with the ALPHA-6 (alpha CAM) and the AMS-4 (beta CAM).

ALPHA Monitors

The ALPHA-6 CAM has incorporated an updated 256 channel analyzer in-comparison with the ALPHA-5A's single channel analyzer. The multi-channel analyzer gives the CAM greater sensitivity over the traditional single channel analyzer. The single channel analyzer in the Alpha 5 is configured to look at all the alpha energies over the ^{239}Pu (5.15 Mev) energy as a total group and subtract a fixed percentage of this amount from the ^{239}Pu region to compensate for Radon interference. This works adequately under equilibrium conditions but unfortunately during atmospheric inversions, and the seasonal months of fall and winter, the build-up and decay of Radon occurs twice per day. During Radon build-up, the 6.0 Mev Radon A (^{218}Po), exceeds the Radon background compensating capabilities of the Alpha 5 thus creating radon induced false alarms. During Radon decay, the circuit over compensates for the radon background. The Alpha 6 CAM uses a multi-channel analyzer with selectable regions of interest to increase the tracking and characterization of radon and, through advanced algorithms, knows the shape of the radon A tail that interferes with the Pu region of interest. This will establish greater sensitivity and fewer radon induced alarms.

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Other technological improvements that are incorporated in the ALPHA-6 to update the ALPHA-5A are 1) Computer output via dual communication ports. This enables information to be transmitted to a printer and communication can be conveyed to other peripherals. 2) Storage of information on energy regions, air flow volume, computed values of counts per minute, total computed counts, and concentration. Each information file includes the most recent 64 seconds, 64 minutes, 64 hours and 64 days. 3) Battery Backup. 4) Secured local keyboard. 5) Internal clock so that all alarms and data can be time stamped, and 6) Remote detector using an inline configuration for stack and duct monitoring applications.

Beta Monitors

The AMS-4, Beta Particulate Air Monitor, is a powerful tool that meets the requirements stated within Regulatory Guide 8.25 and revised 10 CFR Part 20. The major improvement incorporated within this monitor, compared to the AMS-3A, is the significant reduction of the weight. The weight of the AMS-3A is 160 lbs. which is considerably greater than the AMS-4's weight of 31 lbs. The weight of the AMS-3A has been the source of several documented back injuries due to the lifting of this bulky instrument. This extreme weight of the AMS-3A is attributed to the two inch lead shield which encloses the CAM for background reduction. The remarkable weight reduction of the AMS-4 has been achieved through the use of proportional detectors which have better background rejection than ones used in other CAMs. The AMS-4's detectors are housed in separate assemblies that allow remote use (up to 1000 ft) from the main CAM microprocessor. The remote capabilities will reduce potential human exposure therefore adhering to ALARA principles.

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Other technological improvements incorporated within the AMS-4 are 1) Selectable electronic display (no moving parts), 2) automatic subtraction of ambient gamma background interference, and 3) data storage capabilities within the display/processing unit. These retrievable hourly historical data are automatically created and stored for up to 10 days, and can be downloaded to other external peripherals.

5.0 Recommendation and Conclusion

Technological advances within the radiation detection industry have ultimately outdated the instruments that are available within the excess/surplus stock. These machines represent the technology of the 1970's era. The CAM models in use or within the excess/surplus supplies are obsolete and have been discontinued by the manufacturer. This manufacturer discontinuation has terminated production of these models and thus eliminated the availability of spare parts. Therefore, the majority of the excess/surplus CAM's are being reacquired and disassembled by instrument shops for in-house acquisition of spare parts for the instruments that are still presently in-service. The instruments that remain within the surplus yard, after the instrument shop selection, are considered unserviceable and have no identifiable use.

In conclusion, it is being recommended by W-236A projects department that the strategy to acquire surplus/excess radiation monitoring devices be modified. The recommendation is to directly procure instruments that are equal to the technology available within this industry.