



Night Vision and Electronic Sensor Directorate Case

In 2006, Night Vision and Electronic Sensor Directorate (NVESD) was directed to identify products that would improve indoor air quality (IAQ) in its 50+ buildings located on Fort Belvoir. NVESD is one of the premier RDT&E Labs in the Department of Defense with over 3,000 military and civilian employees. The majority of NVESD buildings were constructed in the 1940s and contain numerous IAQ issues ranging from high levels of mold spores and pollens, to pathogens and volatile organic compounds (VOC's).

For years the employees working in these old facilities complained about a variety of IAQ problems and associated health issues. Most complaints were concerning respiratory infections, allergic reactions, itchy eyes and other symptoms. These complaints were brought to the attention of the NVESD Safety Office's Industrial Hygienist who determined that low IAQ was causing a noticeable deterioration in the health and well-being of employees, and consequently a decline in employee productivity, reduced morale and a high level of time off due to illness.

After an extensive search for solutions, NVESD decided to introduce AtmosAir bi-polar ionization (BPI) air purification system to the Facilities Branch Chief. NVESD decided to run a controlled test in its HQ building. The building's occupants were surveyed, without being informed of the survey's intent, to understand the extent of their problems, reasons for time-off and perceptions of the air quality within their work area. As expected, the results of the survey amplified the need to move forward with the installation of the AtmosAir purification system.

On a trial basis, the AtmosAir purifiers were installed into the existing air handling units. These units were allowed to operate for 30 days, again without the knowledge of the buildings' occupants. During the test period, indoor air samples were taken and monitored. An immediate improvement in IAQ was noted. In each case, the particulates, VOCs, bacteria, molds, pollens and other contaminants were reduced below detectable levels. At the end of the month-long test, the Safety Office conducted a follow-up occupant survey. Perceptions of the indoor air quality improved across the board and the number of complaints were dramatically reduced. With this level of success, the Facilities Branch directed that NVESD lab buildings install the AtmosAir systems. Over the next two years, the systems were installed in more than twenty NVESD buildings with similar results. The Safety Office has continued to monitor the IAQ in all buildings where purifiers are installed and test results have been consistently positive.



Recently, another benefit of the AtmosAir air purifiers was observed and tested. Because the purified indoor air was proven to be cleaner than the outside air, a theory was tested that lower energy usage and electric costs could be realized if a reduction in the outside air introduced to the HVAC system could be achieved. One building was selected for a comprehensive test. Gradually, air damper settings controlling the amount of outside air were reduced from 40% to as low as 5% by volume. Tests were performed during the hottest period of the summer and the results are still being evaluated. Early findings suggest that no degradation of IAQ was detected at even the lowest outside air damper settings.

The most significant finding was the reduction in the electricity used for conditioning the indoor temperature and humidity. Results indicate a 23% reduction in the metered electricity required to condition the air in the tested space. It has been determined that energy savings is a benefit of the installation of AtmosAir air purifiers when combined with adjustments to the air intake damper settings. The projected savings will offset the initial investment of the AtmosAir air purifiers over the first three to four years and support the federally mandated energy usage reductions established for all government facilities. NVESD is continuing to install AtmosAir air purifiers along with other emerging energy saving technologies in an effort to achieve the energy reduction goals established by the current Administration.

