



PROJECT ID:  
620

# Industrial Ventilation System Assessment and Design Optimization (SAPO) Tool



The IV-SAPO tool is designed to be intuitive and easy-to-use. (U.S. Navy photo by Mass Communication Specialist 2nd Class Justin Stack)

## OBJECTIVE

This effort will develop a digital interactive tool that will enable non-subject matter experts to design, assess, evaluate, troubleshoot, optimize, and configure industrial ventilation equipment, systems, and designs.

## PROBLEM STATEMENT

The importance of industrial ventilation (IV) systems is often overlooked by facility planners that lack the knowledge and understanding required to anticipate and communicate the risks and consequences of poor planning, design, construction, or maintenance of IV systems. These knowledge gaps often result in the introduction of system deficiencies or dysfunctions at all stages of the acquisition lifecycle, raising the potential for overexposure of personnel to hazardous substances, release of contaminants into the environment, operational disruptions from equipment under performance or breakdown, high energy costs, and high maintenance costs. Better tools are needed to aid selection and installation of these systems.

## DESCRIPTION

The goal of this project is to develop a spreadsheet tool designed for ease of use and readily accessible to all Navy staff operating within the cyber security constraints of the Navy and Marine Corps Intranet digital environment. This tool will be equipped with user guides, standard operating procedures (SOPs), materials, references, and built-in analytics capable of modeling, optimizing, and troubleshooting ventilation system performance, equipment, and operations.

Subject matter experts from the Naval Facilities Engineering and Expeditionary Warfare Center's (EXWC) Industrial Ventilation system Mishap Prevention and Hazard Abatement (MPHA IV) program will build the IV-SAPO tool, leveraging past work on a similar tool purpose-built for energy efficiency cost/benefit analysis under the Navy Shore Energy Technology Transition and Integration program.

The project will consist of two phases. In



Phase 1, the team will develop a roadmap for prototype design, then construct and test individual test modules. The test modules will then be ranked and subjected to end-user testing. The most successful modules will be integrated into the IV-SAPO tool, which will then move into real-world testing at two industrial process operations locations. Based on feedback from these users, the project will move into Phase 2, field demonstration, followed by reporting, validation and technology transfer.

#### RETURN ON INVESTMENT

In the majority of facilities assessed by EXWC staff, optimized designs can achieve an energy savings between 20 to 40 percent. At the four facilities identified in this effort, the expected energy savings would amount to \$689,000 over the next 10 years. For this project, these savings will achieve a simple payback period of less than four years with a net present worth of \$329,000 when assuming a 10 percent discount rate.

#### NAVY BENEFITS

All industrial facilities that generate hazardous pollutants require industrial ventilation systems to capture and control the release of these substances to the environment. The IV-SAPO tool will reduce the risk of these releases by enabling Navy facility staff to proactively identify system deficiencies. Navy facilities that would benefit from access to this capability span across all Navy Shipyards, Naval Air Bases, Naval Air Weapons Stations, and any other Navy facilities that host industrial operations. Through the MPHA IV program, EXWC staff has observed a Navy wide trend of inefficient IV system designs due to a lack of expertise needed to accurately define optimal performance requirements in replacement contract work statements. Use of this tool will generate future revenue by providing end users with design guidance and optimization features to assist them in defining performance requirements for contracted replacement designs.

#### TRANSITION DESCRIPTION

The IV-SAPO tool will be transitioned to numerous end users and stakeholders during the technology demonstration phase of this project. Through field testing, consultation, and planned IV testing and troubleshooting coursework, the IV-SAPO tool will be familiarized with numerous facility staff and up to a dozen distinct activities. The final IV-SAPO tool will be integrated into the MPHA IV program which will act as a transition vehicle for the foreseeable future; both as an aid to facility end users and stakeholders and as a force multiplier for the MPHA IV team. The MPHA IV program commonly interfaces with installation and facility staff at all levels. The utility of the tool is anticipated to be the primary driver of technology transfer as end users adopt the tool for their own use and share with their own team and contacts.

#### CONTACT

For more specific information about this project, contact the Principal Investigator at 805-982-3909.



#### ABOUT THE NESDI PROGRAM

The Navy Environmental Sustainability Development to Integration (NESDI) program is the Navy's environmental research and development demonstration and validation program, sponsored by OPNAV N4I Installations Division and managed by the Naval Facilities Engineering Systems Command from the Engineering and Expeditionary Warfare Center in Port Hueneme, CA. The mission of the program is to provide solutions by demonstrating, validating and integrating innovative technologies, processes and materials and by filling knowledge gaps to minimize operational environmental risks, constraints and costs while ensuring Navy readiness and lethality.

For more information, visit the program's web site at [www.navfac.navy.mil/nesdi](http://www.navfac.navy.mil/nesdi) or contact Ken Kaempffe, the NESDI Program Manager at 805-982-4893, DSN: 551-4893 or [kenneth.c.kaempffe.civ@us.navy.mil](mailto:kenneth.c.kaempffe.civ@us.navy.mil).

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