Department of the Navy SBIR/STTR Transition Program

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ONR Approval #43-8805-21

Topic # N172-134

Abrasive Blasting Nozzle Noise Reduction

Noise Control Engineering LLC

WHO

SYSCOM: ONR

Sponsoring Program: Code 34

Transition Target: Navy Shipyards, PEO Ships, PEO Subs, Bureau of Reclamation (hydroelectric plants)

TPOC:
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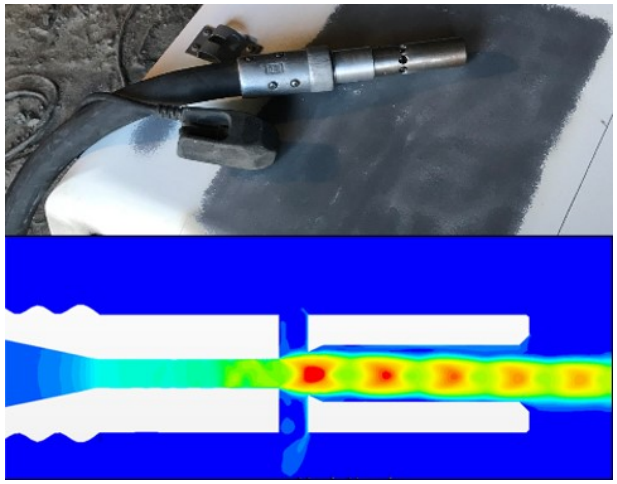
Other transition opportunities: NAVFAC, Navy Shipyards, Commercial Shipyards, Maintenance Facilities



Notes: Disability claims due to Noise-Induced Hearing Loss (NIHL) and tinnitus are the number one expense of the Veterans Administration. Abrasive blasting operations are widely used in military and commercial maintenance facilities and are extremely loud, increasing the risk of worker NIHL. Noise Control Engineering has used its extensive acoustic analytical and experimental capabilities to develop abrasive blasting technology that reduces noise while increasing blasting efficiency, thus saving time and lowering worler safety risk.

WHAT

Operational Need and Improvement: Abrasive blasting is an extremely loud and labor-intensive method for removing paint, rust, and other surface coatings and is widely used in the shipbuilding industry and in Navy shipyards and facilities. Abrasive blasting nozzles can generate noise levels as high as 115 dB(A), putting operators and support personnel at risk for short- and long-term hearing damage.

Specifications Required: Technical objectives are to achieve a 20 dB noise reduction and a 20 percent increase in production efficiency (as measured by the particle velocity) as compared to conventional abrasive blasting nozzles

Technology Developed: Advanced modeling techniques coupled with experimentation resulted in an iterative approach to design a more efficient and quieter abrasive blasting nozzles. Prototypes have been developed that have shown reductions in noise levels from abrasive blasting operations as well as an increase in efficiency thus resulkting in less time required to complete a task. This tesults not only in a decreased safety risk for the warfighre or operator, but a cost savings as a result of reduced task time.

Warfighter Value: The potential for excessive noise exposure resulting in Noise Induced Hearing Loss (NIHL) is widespread across many industries and particularly in the military. NIHL reduces warfighter performance, decreases quality of life, increases safety risk and increases cost to the military of a warfighter is no longer fit for duty and retraining is required for them or replacement personnel. Reductions in noise from sandblasting operations will lead to reductions in hearing loss and compensation claims, as well as improved comfort and job retention. An efficiency increase will also substantially reduce the time needed to perform sandblasting operations resulting in large cost savings.

WHEN

Contract Number: N68335-19-C-0072 **Ending on:** April 1, 2022

Milestone	Risk Level	Measure of Success	Ending TRL	Date
PH1B - Test of first noise-reduction nozzle prototype	N/A	Reduced noise and improved efficiency compared to commercial nozzle	4	3rd QTR FY18
PHIIB - Test many families of improved-performance nozzles	N/A	Multiple nozzle families with improved performance	4	1st QTR FY20
PHIIB - Test prototypes with 3D noise-reduction features	N/A	3D features showed reduced noise	4	3rd QTR FY20
PHIIO - Test next iteration of improved performance in refined prototypes	Med	Reduced noise and improved efficiency	5	4th QTR FY21
PHIIO - Prototype test at Navy Facility (PNSY)	High	Subjective performance and ergonomics	6	2nd QTR FY22
PHIIO - Finalize Price Point	High	Competitive part price in current market	6	2nd QTR FY22

HOW

Projected Business Model: Currently there are two business models being considered: 1) Partner with manufacturing company for production of nozzles. Initial production would consists of low number of nozzles for prototype evaluation in government as well as commercial shipyards and facilities before full scale manufacturing. 2) License or sell intellectual property (IP) to a major commercial company already in the business. Preliminary discussions have already taken place with marketing managers from several major companies that supply abrasive blast nozzles.

Company Objectives: Long range objective will depend on choice of business model. If decision was made to keep itellectual property within the company, objective would to form separate entity for the manufacturing and marketing of the nozzles. If IP were to be sold, objective would be to create a revenue stream throiugh licensing or royalty fees

Potential Commercial Applications: A more efficient and quieter abrasive blasting nozzle has commercial applications across many industries with the marine market being the largest followed by industrial markest which include aerospace, metals & mining and oil & gas. Next in potential market size would be automotive and then the construction markets. Abrasive blast nozzles are used extensively in these industries to clean and prepare surfaces for painting, removing paint and rust from surfaces including ships and various metal machinery. The estimated global market is currently estimated to be $200 million with expected growth rate of about 5% per year.

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