SBIR 06.2 PHASE I - AWARD DETAILS	
ORGANIZATION	AMRDEC (A)
TOPIC NUMBER	A06-008
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YEAR OF AWARD	
AWARD START DATE	
AWARD COMPLETION DATE	
PROPOSAL NUMBER	A062-008-0679
TITLE	Integration of Advanced Inlet Particle Separator and Barrier Filtration Technologies for Turboshaft Engine Operation in Severe Sand Environments
PROJECT MANAGER	Matthew Thomas (256) 726-4800 tsb@cfdrc.com
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KEYWORDS	Inlet Particle Separator, Barrier Filter, Turboshaft Engine
ABSTRACT	Continuing military operations in sand environments have created an immediate need for the integration of advanced inlet particle separator technology and low-pressure drop Z screen barrier filters. CFDRC has teamed with Rolls Royce Liberty Works (RRLW - developer of a highly efficient advanced IPS configuration) and Braden Manufacturing (world leader in industrial gas turbine inlet air treatment filtration) to optimize the integration of these two technologies into a single system. During Phase I multiple configurations, jointly conceived by CFDRC, RRLW and Braden, will be screened to determine the technical feasibility of a fully integrated inlet protection system. CFD modeling software package that has been rigorously validated with benchmark IPS and barrier filtration test data will be utilized to determine the technical feasibility of the integrated inlet protection system. This feasibility will include prediction of A2 fine grade test dust within a T-800 class engine installation. A half-scale assembly of the most promising integrated IPS configuration will be fabricated and tested for A2 fine grade sand collection efficiency. This data will be utilized to validate the Phase I simulation results. The ability of the integrated system to operate within an icing environment and tolerate foreign object damage (FOD) with minimal maintenance costs will be defined. The Option program will focus on continued half-scale testing and adapting barrier filter self cleaning operations associated with the AGT1500 (M1 gas turbine tank engine). Phase II will focus on full scale development and validation of the integrated system with RRLW, Braden Manufacturing and helicopter manufacturers.

BENEFITS	The final integrated IPS/barrier filter technology will find immediate commercial and military applications in all sand environments. By teaming with a major turboshaft and industrial turbine manufacturer CFDRC has positioned itself to immediately commercialize this technology within both the helicopter (Blackhawk, Apache, LHX, Cargo Lifters, Medivac, etc.) and ground power (APUs, large industrial turbines, etc.) markets. In addition, the analysis methodology to be refined here will revolutionize the filtration system design process in all process industries.