System under operation conditions systems will function as part of a total TBC system, thereby enabling increased life and increased engine efficiency and repair costs. Current USN Hot Section Materials were designed for Low Temperature Hot Corrosion (~700 deg C), but new USN operations may require engine materials to withstand higher sustained temperatures (950-1050 deg C) and cycle more often reducing engine life severely.

**Specifications Required**: Operational changes and future needs will require increased gas turbine operating temperatures and change the associated operating environment to one where Type I and Type II hot corrosion AND oxidation will be prevalent in newly anticipated operational profiles.

**Technology Developed**: Candidate systems have been identified through computational methods and are being validated through a production-scale coating process, Directed Vapor Deposition (DVD). These coatings, processed using DVD, have been tested in salt-laden environments using a 100-hour combined cycle without signs of damage to the underlying substrate. DVD is an advanced coating process that enables the development and deposition of complex alloys onto components with non-line-of-sight (NLOS) areas such as turbine blades and vanes. DVD uses an electron beam to evaporate a solid source material that is then directed by a high velocity gas. Due to conditions in the coating chamber, the DVD process is capable of creating high quality coatings onto complex shapes. The ability to simultaneously evaporate from sources with widely varying vaporization points provides further capabilities, such as the creation of a wide range of coating chemistries.

**Warfighter Value**: The new coating composition will enable marine gas turbines to operate at higher temperatures, achieving greater thrust, without risks to component damage, thereby maintaining fleet readiness.

**Projected Business Model**: DVTI seeks to perform coating services for interested parties or discuss licensing options for the technology. DVTI is operating production scale DVD coating equipment that has been utilized for qualification testing of other turbine coating systems and is in the process of upfitting a new manufacturing facility for a separate product line.

**Company Objectives**: DVTI seeks Original Equipment Manufacturer partners such as General Electric, Rolls-Royce, or others for testing and evaluation programs to qualify and transition this coating and related process. We are also looking for opportunities within the Department of Defense to pursue application of this technology in Maintenance, Repair, and Overhaul of gas turbine engines.

**Potential Commercial Applications**: Similar coating systems are also applicable to commercial shipbuilding, where gas turbine engines provide propulsion and auxiliary power to such craft as fast ferries, cruise ships, high-speed yachts, and oil and gas carriers.

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