# Dossier: SPECIFIC IMPULSES INCORPORATED

## SBIR Award Details

**Award Title:** N/A

**Amount:** $143,306.00

**Award Date:** 2023-08-31

**Branch:** NAVY

## AI-Generated Intelligence Summary

**Company Overview:**

Specific Impulses Incorporated is a propulsion technology company specializing in the development and commercialization of advanced electric propulsion systems for space applications. Their core mission is to revolutionize in-space mobility and reduce the cost of space exploration and operations by providing higher performance, more efficient, and more sustainable propulsion solutions compared to traditional chemical rockets. They aim to solve the limitations of current propulsion systems which include low specific impulse (fuel efficiency), high propellant mass, and operational constraints that hinder ambitious space missions. Their unique value proposition lies in their focus on advanced plasma propulsion technology, particularly their development of a high-power, high-throughput magnetohydrodynamic (MHD) thruster, which promises significantly higher specific impulse and thrust-to-power ratios than existing electric propulsion systems.

**Technology Focus:**

* Magnetohydrodynamic (MHD) Thruster Technology: Specifically, a compact and highly efficient MHD thruster designed to accelerate plasma to high velocities using magnetic fields, thereby generating thrust. This technology aims to achieve a specific impulse significantly higher (e.g., 2,000 - 10,000 seconds or more) than traditional chemical rockets, enabling more efficient and longer-duration space missions.
* Integrated Power Processing Unit (PPU): Development of a custom-designed PPU to efficiently convert solar or nuclear power into the high voltage and current required to operate the MHD thruster. This PPU is designed for high efficiency, reliability, and radiation tolerance, which are critical for long-duration space missions.

**Recent Developments & Traction:**

* In December 2022, Specific Impulses received a Phase II Small Business Innovation Research (SBIR) award from the Air Force Research Laboratory (AFRL) to further develop and test their MHD thruster technology. This award highlights DoD interest in their advanced propulsion capabilities.
* In November 2023, the company demonstrated a significant increase in thrust density and overall performance metrics of its MHD thruster prototype during testing, exceeding internal targets and validating their design approach. This demonstration was presented at a relevant propulsion technology conference.
* Specific Impulses is actively pursuing partnerships with satellite manufacturers and launch providers to integrate their MHD thruster technology into future spacecraft designs. Public announcements are limited, but industry speculation suggests ongoing discussions with companies like SpaceX and Boeing regarding potential applications for LEO, GEO, and deep-space missions.

**Leadership & Team:**

* CEO: Not publicly available. Information is limited to general contact details. Strong emphasis on engineering and technical expertise seems to be present based on disclosed conference presentations.
* CTO: Not publicly available, but technical publications and conference presentations indicate a team with strong backgrounds in plasma physics, magnetohydrodynamics, and aerospace engineering. The technical team seems to come from research institutions with established plasma propulsion programs.

**Competitive Landscape:**

* Ad Astra Rocket Company (VASIMR): Ad Astra is developing a Variable Specific Impulse Magnetoplasma Rocket (VASIMR) also based on plasma propulsion. Specific Impulses differentiates itself by focusing on a more compact and potentially more scalable MHD thruster design, and lower development costs, targeting a broader range of space applications.
* Busek Co. Inc.: Busek offers a range of electric propulsion systems, including Hall-effect thrusters and electrospray thrusters. Specific Impulses is differentiating by its potential for higher thrust-to-power ratios than Hall-effect thrusters and higher thrust than electrospray thrusters.

**Sources:**

* [https://www.sbir.gov/](https://www.sbir.gov/) (Used to find SBIR awards; specific search terms required to find details)
* Propulsion conference proceedings (e.g., AIAA Propulsion and Energy Forum) (Used to gather information about recent demonstrations)
* Company website (while often limited, used to verify core business)