



On-Board Auxiliary Power Unit for Tactical Military Vehicle

RCT Systems was also awarded a SBIR contract with the TARDEC hybrid vehicle research group to develop an Auxiliary Power Unit (APU) for military tactical vehicles. The RCT Systems APU can be configured as a standalone unit or geared to the main engine, employing either liquid or air-cooling.

As the US Armed Forces transition to "more electric" technology for mobile mission systems, the existing fleet of tactical and support vehicles are increasingly

limited by the available on-board vehicle power (OBVP). This unique topology affords compact packaging for more practical implementation as a flexible OBVP solution. The selected first application was to be a 4kW APU for the Stryker Light Armored Vehicle (LAV). The same technology is applicable to generator sets providing a competitive advantage over existing solutions for Tactical Quiet Generator (TQG) sets in the Mobile Electric Power (MEP) and Advanced Medium Mobile Power Sources (AMMPS) programs. As a dual-use opportunity, this technology is also applicable to providing auxiliary power outlets on hybrid electric commercial and passenger cars and trucks.

Our proposed machine type is a high speed permanent magnet generator (PMG). A power conversion unit (PCU) will integrate all the functions of converting the PMG power output into 3 selectable electrical outlets: 270VDC, 28VDC, and 120VAC. In Phase I we developed concept sizing and performance predictions for both liquid and air cooled variations. The baseline approach for the Stryker application is an air-cooled PMG and liquid-cooled PCU. In Phase II we proposed performing both functional and military specification compliance testing. Our PCU design is a compact topology with limited filtering requirements that will result in a solution that is superior in size, weight, and total ownership cost.

Because of the generalized nature of the proposed solution it would have direct follow-on applicability for use on Abrams, HMMWVs, FMTVs, and Bradley vehicles. The modular PCU design will be applicable to silent watch APU applications, thus providing the Army a consistent interface for many platform applications. RCT Systems also plans to market variations on the solution for gen-set applications and unmanned ground, surface, and underwater vehicles.

