# DE-FOA-0001836

## INNOVATIVE DESIGN CONCEPTS FOR STANDARD MODULAR HYDROPOWER AND PUMPED-STORAGE HYDROPOWER TEAMING PARTNER LIST (TOPIC AREA 1 ONLY)

UPDATED OCTOBER 26, 2018

| Organization | Contact Name | Organization Type | Area of Technical Expertise | Description of Capabilities | Contact Information (Contact Email Address, Contact Address, Contact Phone #) |
|---|---|---|---|---|---|
| RCAM Technologies | Jason Cotrell | Small U.S. business | 3D Concrete Printing for Large Scale Renewable Applications | RCAM Technologies and its research partners develop 3D Concrete Printing (3DCP) technologies (a rapidly emerging large-scale additive manufacturing technology that eliminates concrete formwork, reduces construction time, and enables new transformative design geometries), and offers consulting services for industrial 3DCP applications such as small hydropower, pumped storage, and other renewable systems. RCAM has access to, and is developing 3DCP materials, reinforcement designs, and printers with print capabilities ranging from 0.1 m to 40 m that can rapidly print large modular or custom components in the field, or off-site in a factory from low cost domestic materials such as concrete. RCAM's founder, Jason Cotrell, has over 24 years of water power and wind power R&D experience, including 22 years working at NREL with a variety of stakeholders including ORNL and DOE. RCAM has led, reviewed, and supported numerous winning DOE and state proposals. RCAM anticipates providing sub-tier and consulting capabilities to project partners for this solicitation. | www.RCAMTechnologies.com Jason.cotrell@RCAMTechnologies.com; 5490 Tenino Ave., Boulder, CO 80303 linkedin.com/in/jason-cotrell-mse-mba-201b30a Phone number not provided |
| Electric Power Research Institute | Paul T. Jacobson, Ph.D. | Non-profit | Environmental aspects of waterpower | Expertise in assessment and mitigation of environmental impacts of hydropower siting, development, and operation | 410-489-3675 pjacobson@epri.com 14820 View Way Court, Glenelg, MD 21737 |
| Cadens, LLC | Randal Mueller | Small Business | AM powertrain plus conveyance | Cadens links design to AM to rapidly build micro-to-small hydro powertrain plus conveyance as an integrated system with fiber-reinforced polymers for end use and molds. | W1860 Main Street, Sullivan, WI 53178 randal.mueller@cadensllc.com 608-358-4101 |
| Resolved Analytics | Stewart Bible | Small Business | Computational Engineering, Early-Stage Optimization, CFD, FEA/FEM, Artificial Intelligence, Prototyping, Turbines | Designing stuff is hard. Building physical prototypes is expensive and time consuming. We help our customers see more clearly the business impacts of design choices by predicting the performance and reliability of their products without setting foot in the lab. Our simulation and analytical services deliver this clarity in less than half the time and at less than half the cost of traditional methods, often uncovering hidden opportunities for competitive advantages in the process. We proudly support collaborative grant opportunities with small and medium size businesses and have expertise in small and micro-sized turbines. | 810 Vickers Ave, Durham NC 27701 stewart@resolvedanalytics.com https://www.resolvedanalyticscom/cfd-consulting 704-559-9560 |

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| AMJET Turbine Systems, LLC, (ATS) | Paul Roos | Small Business | Compact, low weight, variable speed, flow-through turbine/generators, intakes and draft tubes including electronic controls | AMJET develops and builds low head hydro turbine/generators integrating runner and generator in one composite flow-through housing. The scalable concept presently covers 8'' to 63'' runner diameter and from 7 to 50ft head and flow of 6.5 to 800cfs producing 3-1600kW per unit. Operation is variable speed, constant high efficiency, compact electromagnetics and power electronics, lowering footprint and weight up to 5x compared to conventional systems. It has one moving part and operates submerged at any shaft angle and overhauls or replaces in one day. www.amjethydro.com. | Paul W. Roos, Managing Member<br>561 926 1587<br>AMJET Turbine Systems, LLC<br>3588 Main St. Keokuk, IA 52632 USA<br>Tel.: +1 319 524 0900 Direct: 561 926 1587<br>Web: www.amjethydro.com Email: pwroos@amjethydro.com |
| Michigan State University, Turbomachinery Laboratory | Abraham Engeda | Non-profit | Low Head Application turbine design and simulation; General Low Head Turbine Planning. | Michigan State University Turbomachinery Lab spent the last 3 years developing a design methodology for a Low head hydraulic system. The design methodology has a dam-free and fish friendly concept with a promising performance that over 85%. This scalable design methodology could operate between 1.5m to 5m head and flow of 2m^3 to 8m^3. Three regulation methods give this design methodology more flexibility for the various flow conditions. Various blades and stator orientation scheme gives more flexibility for cost assessment and environmental consideration. We are looking for partners in other areas to collaborate on this project. | 428 S. Shaw Lane Room 2442 East Lansing MI 48824<br>engeda@msu.edu<br>517-432-1834 |
| Obermeyer Hydro Accessories, Inc. | Henry Obermeyer | Small Business | Compact, modular, standard turbine, generator and controls packages. Innovative gate systems for turbine and bypass control. | Obermeyer Hydro designs and manufactures patented gates and bulkheads that incorporate arrays of compact submersible turbine generator sets. Also, the Obermeyer Spillway Gate system is a patented bottom hinged spillway gate providing accurate level control and bypass flow capabilities without intermediate piers. | Henry Obermeyer, President<br>hko@obermeyerhydro.com<br>Obermeyer Hydro Accessories, Inc.<br>303 WCR 74 Wellington, CO 80549<br>970-568-9844 |

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| Hyper-Chute Systems, LLC. | Joseph Santos | Small business | Developers of a linear moving mass energy conversion technology | Hyper-Chute Systems, LLC has spent the past 4 years developing a non-turbine energy conversion system for ultra-low head water flows capable of driving generators and pumps. We currently have 4 USPTO patents, and are pursuing a licensing business model to expedite deployments of our technology. Parachutes and sails are the most efficient method of catching energy from a moving mass, i.e. sailing and kite surfing. Water contains 8 times the amount of energy as wind. HCS is developing a controllable framed drogues system to convert ultra-low head water flows into extreme pulling forces to develop low speed high torque rotation. It has been referred to as a water piston engine. Our preliminary damless targeted water flow speeds are from 3-10 MPH, and from 1'-3' feet of head. This allows for the initial contemplated deployment to be channeled adjacent to the river, creating minimal environmental impact. We are designing and constructing a hydro-dynamics test facility with a scientific water flow channel to develop and display our technology, and we are currently seeking and reaching out to industry partners to collaborate on this project. Please visit our Stream Reach page at http://www.hyperchutesystems.com/stream-reach.html for details on partnering with us. | jsantos@hyperchute.com<br>920 Terminal Way, San Carlos, CA 94070<br>650-921-3368 |
| Upstream Tech | Marshall Moutenot | Private Company | Software Development Company with deep experience in machine learning, cloud computing, and data science. | Upstream Tech is a public benefit corporation leveraging machine learning and satellite-based remote sensing to power quantified decision making in water resource management. Upstream's machine-learning models enable the development and rapid scaling of context-rich and versatile geospatial applications. By linking numerous satellite sources into a virtually seamless "Satellite Ensemble," Upstream supplements one satellite's limitations with another's strengths. This allows us to penetrate clouds and employ cloud-masking models, providing more complete coverage and higher levels of analytical accuracy than our competitors. In the context of hydropower development, Upstream produces hydrological forecasts for two primary purposes: (1) selecting site locations for low-head hydropower stations, and (2) optimizing existing dam/reservoir operations, even in ungauged basins. | grants@upstream.tech<br>2401 Monarch St, Alameda, CA 94501<br>510.342.5269 x1004 |

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| Natel Energy | Abe Schneider | Private Company | Hydropower Development & Technology Development (including novel civil works design) | Natel Energy hosts hydropower turbine design and manufacturing, hydropower project development, and software development capabilities. The turbine and civil works design team is led by Natel's Chief Technology Office and President, Abe Schneider, and is comprised of 6 mechanical engineers, two controls engineers, one environmental engineer, and five technicians. Natel's engineering team is expert in CFD modeling (single phase and multiphase flows), high cycle fatigue design and testing (and design of bespoke test rigs), design with carbon and glass fiber composites including a variety of manufacturing techniques including compression molding and resin transfer molding. Natel owns and operates two closed-loop pumped hydraulic test stands, one at 0.3 cms and 4 m head, and another at 1 cms and 10 m head. Natel has particular expertise in design of belt driven machines, including linear turbines, belt driven gates, and other heavy industrial applications. Natel's distributed hydropower development team carries deep experience in developing distributed renewable energy projects at utility scale and includes 4 developers, one project civil engineer, one project electrical engineer. Natel's hydropower development efforts are enhanced by its software team, Upstream Tech, which leverages machine learning and satellite based remote sensing to enable quantified decision making in water resource management. In the context of hydropower development, Upstream produces hydrological forecasts for two primary purposes: (1) selecting site locations for low-head hydropower stations, and (2) optimizing existing dam/reservoir operations. | grants@natelenergy.com<br>510.342.5269 x1004<br>2401 Monarch St, Alameda, CA 94501 |