Cooperative Educational Services
CES

SOLE SOURCE PROCUREMENT JUSTIFICATION

Pursuant to New Mexico Procurement law, NMSA 1978 13-1-126, CES Procurement Department will post this Sole Source Procurement Justification for 30 days prior to any purchase of goods/services

Date of Request: 5/3/2023

Request Submitted by: Gustavo Rossell
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Proposed Vendor: Physical Science Research Associates Ltd.
Estimated Spend: $500,000.00
Proposed Term: One (1) year

Contact: Professor Anatoliy Glushchenko
Title: Founder, Physical Science Research Associates
Phone: (719) 310-7815

Description of Products / Services to be procured.

a) Delivering *Physics in a Box™ – Mechanics, Physics in a Box™ – Optics, and/or Physics in a Box™ – Electricity & Magnetism* Science Kits

b) Delivering Mechanics, Optics, and/or Electricity & Magnetism curricula which accompany the *Physics in a Box™* - Kits – for middle school and high school, as well as Elements of Physics curricula for elementary school.

c) Weekly teacher training sessions on Physics – content knowledge, methodology, and pedagogy.

d) Providing year-round support for teachers by answering questions, sharing methodological methods, blending *Physics in a Box™* curricula into the existing science program in schools.

Basis for Sole Source Request.

a) Following recent educational trends and requirements of the businesses for technological talents, and as a part of addressing the changing academic standards in the state of New Mexico, it is of a paramount importance to significantly expand the Physics program in middle school and high school and add Elements of Physics to the elementary school curriculum.

b) When Physics is introduced into the schools' curriculum, it is much easier to teach it through the experiment-based approach where students learn "through doing and applying" rather than "through listening, reading or watching videos."

c) The school districts are in need of high quality, durable and reliable hands-on equipment/science stations to teach Physics in grades 3-5, 6-8, and 9-11 (elementary school, middle school, and nigh school). Such equipment/science stations must require minimum to no maintenance and must be reused for many years to come.

d) The school districts need curriculum to address the change of the science standards. In addition, the curriculum needs to address the modern requirements of what Physics knowledge students must have in order to be successful in Science and Math classes, and to foster more students to choose science related areas as a part of their future career.

e) The school districts of NM are devoted to the development of technological workforce needed for the geographical area of the district by providing their students with rigorous and effective programs.

f) The school districts are in need of the teacher preparation program which prepares teachers to teach the concepts of Physics on a level required by the new academic standards, hands-on approach, and modern trends.

g) It is imperative for all three areas of the chosen program (physics tools, physics program, and teacher training) to be synergistically aligned between each other. A single vendor is a preferred method as it minimizes the operational and logistical costs and maximizes the efficiency of implementation and ongoing support.

The unique capabilities of the prospective contractor that makes the prospective contractor the one source.

Physics in a Box™ program is created by Physical Science Research Associates Ltd under the guidance of Prof. Anatoliy Glushchenko. The company owns all copyrights to the materials and methodological methods.

Professor Glushchenko joined the faculty of the University of Colorado at Colorado Springs Department of Physics and Energy Science in 2005. He has extensive collaboration with many university research labs, government labs, and industries. His work is sponsored by the National Science Foundation, Research Corporation, Army Research Office, DARPA, Navy, Air Force Research Lab, and NATO Science for Peace Program. Also, his applied research, materials and devices development are sponsored by small businesses and large corporations, such as Lockheed Martin, Kidde, Cobham, LG-Phillips, Bosch, and others. As such, through his work at the University with students, he knows exactly what set of knowledge students need to possess in order to succeed in the science and engineering related areas.

Besides his extensive research practice, Dr. Glushchenko has a wide range of teaching experiences, from high school to undergraduates and to graduates and in a very diverse international environment – Europe, Asia, and in the United States. Outside of his work at the University, Dr. Glushchenko is an established expert on methodology for Physics and Mathematics for elementary, middle, and high school. His expertise includes the development of interdisciplinary classes, problem solving approaches, and hands-on to connect Physics and Mathematics with other disciplines. He is founder of Physics in Middle School as a Separate Discipline Program and the author of the Elementary School Math Integrated with Science Program.
Physics in a Box™ program of Physical Science Research Associates Ltd. created by Prof. Glushchenko has a proven track of success and is adopted by many schools and school district in the United States and is the only program in the United States that provides age-appropriate physics lab equipment, curriculum, and teacher development as a comprehensive aligned package for elementary, middle, and high schools.

How is this uniqueness substantially related to the intended purpose of the contract?

a) Each of the *Physics in a Box™* program (Mechanics, Optics, and Electricity & Magnetism) are <u>all-in-one packages</u> created by Physical Science Research Associates Ltd.; these packages provide:

- all hands-on tools (manipulatives),

- curriculum,

- and an extensive year-round teacher training program to teach Physics in middle school and high school and elements of physics in elementary school.

b) This program is based on international experience of Prof. Glushchenko and parallels the approaches exercised in leading European and Asian countries.

c) *Physics in a Box™ – Mechanics* is the first area in a series of *Physics in a Box™* – Mechanics, *Physics in a Box™* – Optics, and *Physics in a Box™* – Electricity. All areas represent the essential foundation of physics that has the most impact on students understanding and application of math and science, are connected with each other, and possess a sequential progression of the material from one area to another.

d) Not only purchasing the program will equip teachers with the tools and materials, but the teachers will benefit from a whole year of teacher preparation program as a part of the package.

Explain why other similar professional services, services, construction or item(s) of tangible personal property *cannot* meet the intended purpose of the contract.

a) Physical Science Research Associates is the only company in the United States providing such services. There are no providers which provide the equipment, curriculum and a whole year-round teacher preparation program to teach the curriculum – by the volume and closeness of contacts with the teachers.

b) *Physics in a Box™* program is derived from the best European and Asian educational practices which lead to an outstanding level of technological workforce and surplus in strategic areas such as computer science, cybersecurity, engineering, medical professionals, and many others. It also allowed for students' high scores for many years now compared to the US students (PISA stats). It distinguished from the existing programs by a rigor and depth yet easy to understand of the material, alignment with all existing in United States academic standards, connection of Physics material to math, and the scope of preparing students to other science taught in the school or required by the workforce.

Agency's due diligence in determining the basis for the procurement.

The following educational materials and educational services providers were surveyed through studying web resources available:

Cengage Learning
Houghton Mifflin Harcourt
McGraw-Hill Education
Pearson Education
Scholastic
Bertelsmann
Emerald Group Publishing
Macmillan Learning
Taylor & Francis Group
Wiley
Wolters Kluwer
Penguin Random House
Hachette Livre
Springer Nature
Oxford University Press
Simon & Schuster
RELX Group
Informa

The following Physics school tools providers were examined:

Physics classroom – Fisher Scientific
PASCO
Timstar: School Science Equipment
Arbor Scientific
Physics – Philip Harris
American Institute of Physics
Better Equipped: School Science Supply

Our extensive survey of American companies and educational services providers revealed that all service providers in the United States are using existing in the country academic standards and directed toward a traditional track of teaching Physics in the high school and Physical Science in the middle school. In contrast, Physics in a Box Program introduces a new paradigm of teaching Physics – in parallel to how it is done in leading European and Asian countries:

a) Physics is introduced as a separate discipline in grade 6 and continues to be taught in Grades 7, 8, 9, and 10. This prepares students to their further choice of Physics and other Science classes in grades 11 and 12.

b) Physics is taught on a concept-based level in grades 6, 7, and 8 and on a Pre-Algebra and Algebra 1 levels in grades 9 and 10.

c) Each of the areas of *Physics in a Box*^{TM} – Mechanics, Optics, and Electricity & Magnetism come with tools and more than 100 experiments. This provides an opportunity for teaching Physics as a separate discipline in all grades three times a week.

d) Physical Science Research Associates is the only company in the United States which works with teachers the whole year-round, preparing them to teaching Physics.

Requestor Signature:  **Date:** 5/3/2023