

SUBJECT: SAMPE OF STATEMENT OF WORK

**STATEMENT OF WORK
FOR
ADVANCED COMPOSITE MATERIALS AND MANUFACTURING
TECHNOLOGIES**

BACKGROUND: The ARDEC is a Department of the Army organization that provides the United States military with the firepower necessary to achieve decisive battlefield victory. Its mission is to provide research, product development and full life cycle engineering for ammunition, weapons, sophisticated fire control technology, and explosives and propellant. ARDEC serves its customer by exploring advanced technologies, designing new products, procuring demonstration quantities, supporting the manufacturers with product and manufacturing know-how, trouble shooting user problems in the field and supporting demilitarization. Furthermore, ARDEC is a key player in transforming the Army into a more mobile, agile, strategically responsive force that is dominant across the full spectrum of operations. ARDEC has in place the structure, programs and initiatives to meet the challenges, which includes supporting the future Objective Force, as well as the near term Interim Force and the existing Legacy Force. In order to accomplish its mission in an optimal manner and the Army's vision to field the future Objective Force, it is paramount that ARDEC collaborates and cooperates with industry, academia and other agencies.

ARDEC has a great depth of experience in design, development, fabrication, test, evaluation and analysis of ammunition and weapon systems. Its scientists and engineers have complete life-cycle responsibility from tech base maintenance to engineering support for production, fielding and demilitarization.

The Center for Composite Materials (CCM) at the University of XYZ has been a world leader in composite research and education for more than 25 years. The center has a history of collaborations with well over 100 entities representing materials suppliers and end users in the aerospace, automotive, and durable goods industries. These entities have consistently benefited from their affiliation with CCM.

ABC INC.'s Composite Product Operation (CPO) is focused on advanced material technology which achieves lower weight, improved thermal control and structural performance, and part fabrication costs competitive with current metallic designs. ABC INC. has over ten years of history of producing prototype and production composite part for missile-related applications and many other types of defense systems.

OBJECTIVE: Through cooperative research and development, all parties intend to design, evaluate and integrate composite material(s) and its manufacturing technologies into various ammunition as well as weapon system/sub-system components developed by ARDEC. All technical projects identified and executed under this AGREEMENT will

decrease the life-cycle costs of the component; significantly reduce the weight of the component and improve component structural performance.

APPROACH: The first effort under this AGREEMENT will be a joint feasibility study exploring the use of composite materials in the XM984 Extended Range, Dual Purpose Improved Conventional Munition (ER-DPICM) 120mm mortar cartridge. Two critical components of ER-DPICM have been identified for the study. They are the cargo center body and the rocket motor body.

ARDEC will perform the following tasks:

- Provide XM984, ER-DPICM, design parameters and necessary drawings
- Assist in the design and selection of composite material(s)
- Assemble composite prototype components, rocket motor bodies and center bodies, as required and prepare units for test and evaluation
- Perform bench and/or live fire tests
- Provide range facilities for test and evaluation of prototype
- Reduce test data and publish report

CCM, University of XYZ will perform the following tasks:

- Provide information on recent technological advances in the field of composite materials
- Provide a broad range of technical expertise through academic research staff and faculty
- Access to state-of-the-art composite manufacturing, characterization, testing, NDE, and computational equipment in CCM's Composites Manufacturing Science Laboratory
- Provide necessary composite material and expertise, and manufacture prototype components
- Assist in designing, manufacturing and testing prototype components

ABC INC. will perform the following tasks:

- Review ER-DIPICM OGIVE design parameters and drawings
- Assist in selecting composite material for prototype fabrication
- Design and manufacture tooling for the fabrication of two prototype OGIVE components
- Perform necessary mechanical tests during prototype fabrications
- Fabricate two OGIVE components for ARDEC bench and/or live fire testing
- Assist ARDEC during assemblies and testing of these prototype components
- Assist ARDEC analyzing test data
- Provide preliminary Production Costs for OGIVE component
- Provide manufacturing concepts and preliminary production costs for Cargo Center Body Component

It is anticipated that each party will provide all funding for its effort under this XM984, ER-DPICM, feasibility study. However, all parties intend to seek leverage funding from Army or private sector organizations, which will benefit from the work performed within this CRADA.

The conduct of work will be guided by a Joint Steering Committee, comprised of representative(s) of ARDEC, UNIVERSITY of XYZ and ABC INC. management which will meet regularly, in coordination with the principal investigators, to plan and review the direction of the research effort. Future project efforts may be incorporated by amendment to this AGREEMENT, consistent with the objectives outlined above. Each project effort will define the project objective, the specific approach for project completion, amount and type of work to be performed by each party, milestones and other pertinent information.

TimeLine(estimated):

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|----------------------------------------------|----------------|
| ➤ Review ER-DPICM Ogive Design & Drawings | January 2001 |
| ➤ Select Material | January 2001 |
| ➤ Design & Manufacture Tooling | April 2001 |
| ➤ Fabricate Prototype/Ogive Components | May 2001 |
| ➤ Deliver Prototypes to ARDEC | June 2001 |
| ➤ Perform Component Testing | June/July 2001 |
| ➤ Provide Preliminary Production Ogive Costs | September 2001 |