Space Technology Development Program

STDP

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Canada

Overview

- Mandate
- Goals and Objectives
- Benefits
- Priority Technologies
- Implementation
- Current and Planned Mechanisms

Mandate

To develop strategic technologies that have a strong potential for having a positive impact on meeting the future needs of the Canadian Space Program and the growth of the Canadian space industry.

Goals & Objectives

The objectives of the STDP are to:

- Reduce the technological uncertainties associated with planned Canadian space missions;
- Stimulate industrial innovation in space-related technologies in preparation for potential future space missions;
- To support the development of space technologies for the purpose of increasing the commercial potential of Canadian space companies.

Benefits

- Supports the necessary technology development for Canada's future missions;
- A better understanding of the technological challenges associated with planned space missions and thus the reduction of technological uncertainties linked to these challenges;
- Supports the development of innovative, emerging, enabling and promising technologies
- The capitalizing of innovation and market opportunities; as well as,
- The creation of gainful employment and the attraction of highly qualified personnel to the space sector

Priority Technologies

Based on:

- Future missions' specific technology requirements and roadmaps
- Canadian leadership positioning
- Technologies with a potential for positive industrial impact

Delivery Mechanisms

- Periodic Request for Proposals (RFP)
  - Typically issued on an annual basis in the fall;
  - CSA provides detailed statements of work;
  - Implemented through PSPC R&D contracts;
  - Reduce the technological uncertainties associated with planned Canadian space missions.
  - Next RFP is planned for the end of September, early October and posting (on Buyandsell.gc.ca) should last 6 weeks

Implementation

- Contributions Announcement of Opportunities (AO's)
  - Implemented through non-refundable contributions;
  - Supporting up to 75% of eligible incurred costs;
  - To support the development of Canadian industrial capabilities in the area of space technologies for the purpose of increasing the commercial potential of Canadian space companies.
  - Last AO was issued last winter, 50 agreements have been but in place
  - Next AO is planned for Fall 2021

Innovative Solutions Canada

- Fuel the development and adoption of technological innovation in Canada.
- Support the growth of innovative Canadian SMEs.
- Foster greater industry-research collaboration through the release of challenges for solutions that address key GoC priorities.
- Provide departments and agencies with opportunities to develop new capabilities to meet their R&D needs and thereby advance government priorities.

Investment Context

- CSA Commitment to ISC Programme: $ 1.3 M/year (minimum)
  - Managed by STDP
- ISC approach:
  - Based on « Challenges »; i.e. statement of a key issue for which a solutions is sought, but not specified.
  - Phase 1: Multiple contracts – up to $150k each (proof of concept)
  - Phase 2: Selected contract(s) – up to $1M each (prototyping)

Status on Challenge 1

Artificial Intelligence and Big Data Analytics for Advanced Autonomous Space Systems

- 51 proposals received
- 5 contracts awarded for Phase 1 in Fall 2019
  - Ending in early March
- 1 contract (or potentially 2) will be selected for Phase 2
  - Down selection will be performed in September
- Phase 2 contract(s) will be conducted over 2020/21- 2021/22

Proposed Challenges

Space Robotics Challenges

1. **Low mass volume and power, high reliability Short Range Proximity Sensor for space robotics collision prevention**.

   Operable in vacuum, immune to direct sun light, and with low false alarm rate.

2. **Visual AI for space robotics end-effector and pitch plane Obstacle Detection.**

   Currently performed by ground controllers for MSS. ISS model and MSS camera imagery will be made available to bidders interested in real life conditions.

3. **AI for auto-diagnostics and early failure prediction for space robotic sub-systems.**

   MSS sub-system telemetry data will be made available to bidders interested in real life conditions.

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