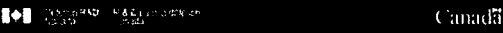



Laser Optical Countermeasures Against Threat Environment Scenarios (LOCATES)


Industry Day

March 3rd 2009





Outline

- Welcome
- Presentation of LOCATES team member
- Why an industry day
- Context
- What is LOCATES - Project Management
- Procurement Strategy (to be approved)
- Prototype Intellectual Property
- Current DRDC Solution - Description
- Trials in Maritime Environment
- From Laboratory to Ship
- Lunch




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Presentation of LOCATES Team Members

- NAVY
- PWGSC
- DRDC




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Why an Industry Day




- To inform the industry about our project and challenges that come with it
- To get feed-back from the industry about our project

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Current Situation

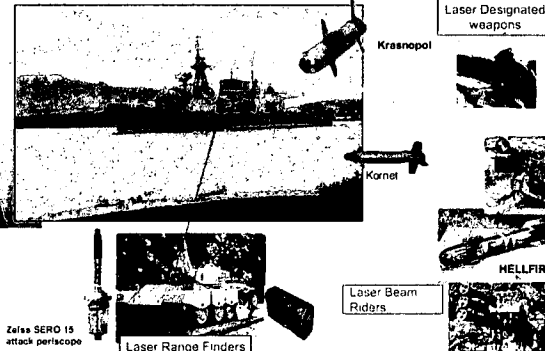
- Context: Navy's mission has changed
- Proliferation of laser threat
- Existing defence systems onboard ships not optimal for laser threat
- Lots of knowledge and expertise on laser resident in DRDC

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Laser Threat

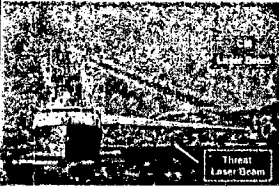
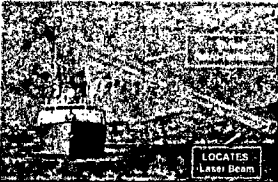


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Project Objectives

1. Develop a laser detection and CM prototype through exploitation of technologies developed at DRDC-V
2. Provide recommendations on the optimal technological approach to laser/optical protection in harbors and littoral operations
3. Facilitate the transition of prototype to production quality systems suitable for operational use



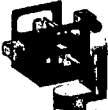



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What is LOCATES

Description of Work (1)

- Develop a naval prototype of a surveillance and CM system integrating:
 - BRILLIANT
 - LASSOS
 - GLARES
- Has to be stabilized, waterproof, radiation proof, able to support sea state at level 3, etc






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What is LOCATES

Description of Work (2)

- Develop a 3D engagement model for LBR and LTD
- Demonstrate prototype in an operational context

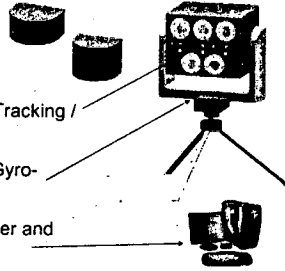


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Project Scope

Future LOCATES Naval Prototype

- LTD Detection Head
- LBR Detection Head
- LOCATES Detection / Tracking / CM Head
- Pan & Tilt Device and Gyro-Stabilization System
- LOCATE Base (computer and acquisition cards)




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Project Scope

Implementation Approach

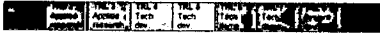
- Maximum use of commercially available components, including
 - Stabilization platform,
 - Photonic sensors,
 - LWRs (laser warning receivers)
- Exploit technologies already developed under previous projects in DRDC
 - BRILLIANT tracking system
 - Code breaker
 - Eye safe laser dazzling



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Readiness Level

LOCATES Key Technology Areas		Current TRL	TRL Goal
LASSOS (against LTD)	Far-Off-Axis Laser Detection	4	6
	Ultra-Sensitive Laser Sensors (Detect laser scattering)	4	6
	Countermeasures - Laser Decoy	3	5
BRILLIANT (against LBR)	Off-Axis Tracking	5	6
	Countermeasures - Dazzling	5	6
	Countermeasures - Jamming	2	4
GLARES (Laser Surveillance)	Optic Detection Using Retro-Reflections	5	6
	False Alarms Rejection	3	5



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Effort from DND (\$)

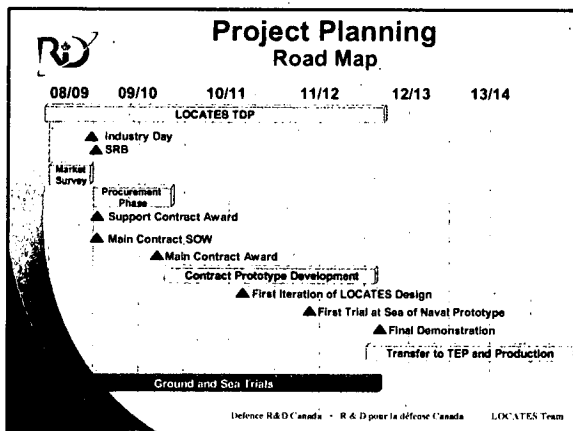
Funding and contribution	FY 08/09	FY 09/10	FY 10/11	FY 11/12	Totals
DRDC Funding and FTE Cost	1440K	1670K	3625K	2280K	9015K
In Kind (Nat. Testing)	850K	800K	800K	800K	3250K
In Kind (Int. Testing)	500K	550K	550K	550K	2150K
Partners	-	TBD	TBD	TBD	TBD
Totals	2790K	3020K	4975K	3630K	14 415K

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Project Planning Milestones

Milestone	Event	Planned Completion Date
1	Project Approval-in-principle	February 08
2	Project Implementation Approval	March 09
3	Main contract SOW	April 09
4	Support contract award	January 09
5	Main contract award	January 10
6	First iteration of LOCATES design	September 10
7	First trial at sea of the naval prototype	April 11
8	Final demonstration	February 12
9	Project Completion	April 12


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- ### Project Demonstrations
- At least two naval tests for the naval prototype
 - At least four naval tests for lab prototype
 - Continuous ground test for lab prototype
 - Ship used: CFAV Quest, Navy ships and allied ships with help of CF-18 illumination capability (as in 2008 trial) and helicopter
 - Sea trials in variety of atmospheric conditions including equator and north sea
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- ### Project Status
- Efficiency metrics with OR team
 - Trial at sea with BRILLIANT, GLARES and LASSOS
 - Writing of SOW in progress
 - Support contract awarded
 - 3D engagement model development in progress
 - Market survey almost completed
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- ### Procurement Strategy (1)
- (to be endorsed by Senior Review Board)
- Principal contractor to build a stabilized naval prototype for ship and to integrate algorithms and software
 - Choice of principal contractor will be done within a competitive bid
 - Only contractor with experience on developing and installing electro-optical devices on war ships will be considered
 - Main contract to include clauses for maintenance and improvement
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Procurement Strategy (2)

- DRDC and support contractor to fine tune the current laboratory prototype to:
 - Finalize hardware design and specification for the naval prototype
 - Feed main contractor with key know-how from DRDC (software and algorithms)
 - Contribute to TTCP trials and stay in touch with our international partners




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Prototype - Intellectual Property

by
Alexandre Parent


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Intellectual Property (IP): Some Definitions

- **Foreground Information**
Invention first conceived, developed or reduced to practice as part of the Work under the contract and all other Technical Information conceived, developed or produced as part of the Work under the Contract
- **Background Information**
All Technical Information that is not Foreground Information and that is proprietary to or the confidential information of the Contractor, its subcontractors or any other supplier of the Contractor


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Intellectual Property (IP): Rights & Obligations

- Contractor to Own Intellectual Property Rights in Foreground Information.
- Contractor will give a license to Intellectual Property Rights in Foreground Information to the Crown.
- Contractor will give a license to its own Intellectual Property Rights in Background Information to the Crown.


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Intellectual Property (IP): Rights & Obligations

- What are the consequences :
 - The Crown may use the results of the Work under the contract as it sees fit (which includes future R&D and/or procurement contracts)
 - Any improvement to the Foreground information made by the Crown outside the scope of the Contract belongs to the Crown.
 - The Contractor may use the foreground information and its own background information as it sees fit.
 - The Contractor must obtain a licence from the Crown to use the Crown's Background Information.


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The DRDC Solution

by
Jacques Dubois
Philippe Bélanger


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Trials in Maritime Environment

by
Francoise Reid


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From Laboratory To Ship

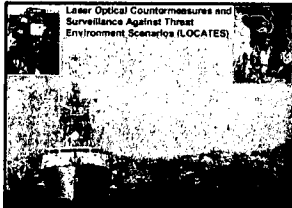
by
Patrick Or
Canadian Navy

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- **Trust matters** – Favour coalitions of trusted partners, from warfighters to scientists
- **Knowledge matters** – Balance the S&T cooperation spectrum from knowledge co-development to technology co-development
- **Speed matters** – Synchronize S&T cooperation to the operational need for solutions
- **People are crucial** – Smart, informed scientists and engineers enable stronger coalitions (engage the best and the brightest)

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 <p style="font-size: x-small;">Laser Optical Countermasures and Surveillance Against Threat Environment Scenario (LOCATES)</p>	<p style="text-align: center;">LOCATES TDP (11an)</p> <p>Partners: DMRS, DMSS, CFMWC Project Director: Greg Walker Project Manager: Janet Alain Scientific Authority: Francoise Reid Delivery by: DRDC-Valcartier, DRDC-Atlantic Linkages: TTCP EWT TP-S; Industry: Aerex, IMAGO Start-End: April 2008 - March 2012</p>
<p>Objectives:</p> <ul style="list-style-type: none"> • Detect, locate and counter laser assisted threats to ships in the littoral • Detect and locate military optics and optically assisted weapons on the coast <p>Technologies:</p> <ul style="list-style-type: none"> • Laser retro-reflection surveillance (active) • Off-axis laser detection and tracking • Ultra-sensitive laser detection • Laser countermasures <p>Capabilities:</p> <ul style="list-style-type: none"> • Detect, locate and defeat laser-assisted threat in harbor and littoral environment. • Detect & localize active weapon sight/optics 	<p>Outputs/Deliverables:</p> <ul style="list-style-type: none"> • Provide recommendations on optimal tech. approach to laser/optical protection in harbour, littoral operations and open ocean. • Demonstrate the architecture of an un-manned self-defence system against laser-assisted threats of the first and second generation. • Prototype of an active surveillance system for the detection of weapon sights based on laser retro-reflections. <p>Outcome:</p> <p style="font-size: x-small;">Increased ship survivability against laser &/or optically assisted threats in littoral environment and open ocean</p>

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 in the advancement and maintenance of
 Canada's defence capabilities.

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