Lockheed Martin/Sandia National Laboratories
Fostering Strategic Alliances

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May 17, 2007
Prescription for a Strategic Relationship

• Commitment and attention to program from all levels
• Development of partnership goals annually
• Host strategy meetings at both locations
• R&D synergy across both national lab and partner
• Focused investment based on key technology areas
• Technology Board reviews and approves proposals
• Clear understanding of project expectations
• Semi-annual program reviews
• Strong business case results in good project selection
• Projects are important to both industry partner and NNSA/lab
LM/Sandia partnership benefit analysis

- Conducted assessment of the partnership value to Lockheed Martin and NNSA/Sandia
- Determine factors that influence successful projects
- Understand how to best influence future business and technical success
LM/SNL Partnership is valued by Lockheed Martin

Common themes:

- Results of joint projects impacted current high-value programs/projects important to our nation
- Technology developed during collaborations was key enabler
- Results of combined technical capabilities provide credibility to improve business creation
- Technical results may be transferred to other programs and/or business entities.
- Projects save Lockheed Martin program significant time and money
Benefits to NNSA/Sandia - “Sharpen the Saw”

- Program supports Sandia mission
- Stability - consistent multi-year funding
- Strengthens Sandia’s technology base and matures technologies to bridge the “Valley of Death”
- Provides understanding of capabilities for joint BAA proposals
- Helps establish elements of national constituency
- Imports partner best practices
- Shared understanding of future national security needs, which assists development of technology roadmaps
- Customer participation in other NNSA/Sandia initiatives
Electromagnetic Missile Launcher (EMML)

EMML Technology:
• 4 year, $1.3 million project (MS2)
• Launcher utilizes electric energy in future electric ships (CGX)
• Scalable to larger missiles
• Scalable to smaller munitions' applications (countermeasures)
• Multi-purpose launching system

EMML Advantages:
• Eliminate gas management system
• Reduce IR signature of weapon platform
• Reduce visual obscuration and radar interference
• Mitigate restrained firing risk
• Potentially reduce chemical propulsion

Contract Mechanism:
• CRADA
• Significant IP developed
• Both parties declare background IP (BIP)
• Potential licensing of BIP by each party
• Cross-licensing agreements for IP jointly developed
• Joint patent applications
EMML Success

Lockheed Martin Payback
• Anticipate $20M payoff within 5 years
• Overlapping R&D efforts between LM companies
• Technology can be leveraged by other ESBA BA’s
• Extensive knowledge gained and leveraged due to project

4 year Shared Vision $1.3 M

Sandia Payback
• Additional projects funded to Sandia (Navy & LM funding)
• Anticipated $6M payoff within 5 years
• Technology and industry experience gained
• Technology leveraged for DARPA EM Mortar Program

EMML work continues in 2007 under a new CRADA agreement
MiniSAR – Sky Spirit UAV Flight Experiments

SNL Interest
Advancing the state-of-the-art in RF and radar systems in support of Sandia’s core missions, and delivering these technologies to end-users for high impact national defense and security applications.

The Technology
To develop an advanced imaging capability to optimize automated analysis of its output data. High data volume means human examination is no longer feasible or desirable and automated analysis is fundamental in the design. This project will provide LMC with technology discriminators on proposed surveillance systems and current aerial video efforts. State-of-the-art algorithms will outperform LMC competitors and when demonstrated on program-relevant data, they will provide key proposal elements. In addition, the integration of the algorithms into LMC prototypes and demonstration systems will provide tangible, advanced capabilities for LMC.

LM Applications
The potential impact of this project is significant. LM MS2 is positioning as the supplier of choice for small UAV platforms & sensors. Disruptive capabilities are low cost modular systems that can be easily tailored to mission needs by LM and/or the user immediately prior to the mission. A SAR capability via a small UAV will be a discriminator for LCS/Deepwater providing all weather ISR. In addition, applications supporting ground operations with the Army and SOCOM are being pursued. FCS also has long-term requirement for a small UAV with a SAR capability.
UAV Characteristics
- Payload capacity 50 lbs
  Accommodates Mini-SAR, raw data recording capability, special mounting, etc.
- Payload Cassette Volume
  - Accommodates miniSAR REA, AGA
  - Accommodates additional space for raw data recording, payload management, and data communications links
- 600+ W, 5, 12 and 28 VDC power
  - Mini-SAR, data link, raw data recording, reserve
  - Accommodates radome
  - High speed data link
  - Robust control data link

Mini-SAR Characteristics
- Provides Real Time Images
  True real time, 4 inch res. images
- Volume
  ~10 in cube – Antenna/Gimbal Assembly
  ~ 7 in cube – Radar Electronics Assembly
- Weight - 27 lbs
  Does not include weight for raw data recording or any special mounting hardware
- 300 W 28VDC
  Includes processing of raw data, but not data recording

4-Inch Resolution Stripmap
Mini-SAR Accomplishments

• Yuma (Desert Talon) exercise ... very successful!
• MiniSAR sensor successfully integrated, debugged, and tested in LMCO-designed sensor payload.
• MiniSAR on Sky Spirit airborne demonstrated at Camp Ripley, MN, 10/19 thru 10/20/2006.
• 4-inch resolution spot mode, strip-map, and CCD successfully demonstrated.
Questions?
Lockheed Martin/Sandia Technical Partnerships

Background

• Started focused relationship in 1999
• LM executives recognized opportunity to leverage Sandia’s capability for their programs
• Relationship is managed at LM Corporate with significant attention and participation by LM Business Areas
• Umbrella CRADA and WFO/NFE Standard T&Cs put in place to streamline contracting

Purpose

• Leverage Sandia investment & LM technologies and relationships with OFA customers for mutual benefit
• Fund projects that are collaborative in nature and support mission needs for both companies
• Demonstrate LM Corporate commitment to NNSA
LM carefully and strategically selects projects

Strict criteria for selection:
• Why is Sandia required?
  • Expertise of staff
  • World-class facilities
  • Ability to leverage Sandia investments
• Is the technology a key discriminator for the business area or corporation?
• Can the technology be applied across the corporation?

Other factors considered:
• Proposals parallel to IRAD funding to encourage synergy
• Sandia’s strong relationships with customers
• Sandia’s significant time and investment in technology areas
• Significant time and energy invested by Lockheed Martin PIs in preparing proposals
First Half of SV Program (1999–2002)
• Developing relationships, building trust, understanding capabilities
• Seedling projects
• Most No Impact projects started in this time frame

• Studies replace seedlings
• Sandia has better understanding of LM business and culture
• Lockheed Martin has better understanding of Sandia capabilities, applications to Lockheed Martin programs, and Sandia culture
• Direct Impact projects increased in this time frame
• Continuity of PIs has increased success
• Successful PIs are mentoring new PIs

Lockheed Martin and Sandia are targeting better now than before
Strategic Partner Program Attributes -- Critical Success Factors

Relationship is most important
- Establish strong relationships at each level of organization
- Ensure commitment and attention to program from all levels of both organizations
- Establish account executives, managers and/or teams
- Manage communication and coordination carefully (protocol)
- Develop partnership goals annually
- Understand and respect culture differences
- Manage “thorny” issues effectively

Long-term investment managed at customer’s executive level
- Manage program at executive level with flow-down through customer organization
- Governance board makes project/funding decisions at executive level
- Investment commitment is on annual cycle
- Program processes should be identical to customer’s internal investment process
- Formal reviews encourage commitment, innovation and leveraging

Customer and Sandia are Interdependent
- Visits to Sandia and to customer sites by all levels of organization are necessary to understand needs and capabilities, develop support at all levels of organization
- Long and short term plans, including roadmaps, are shared
- Opinion or help with investment plan development is sought from other party
- Expertise and competitive value of both parties increases as a result of the relationship

Clear understanding of project and program expectations
- Projects are important to both customer and NNSA/Sandia
- Strong customer business case results in good project selection
- Leverage applicable results to other projects within the partnership as appropriate
- Allow for “seedling” projects
Model for Strategic Relationship Interactions

Qualities

- Sharing of long and short term plans to better leverage counterpart strengths
- Jointly develop strategic technology forecasts and each partner’s role
- Develop annual mutually beneficial partnership goals
- Ensure commitment and attention to program from all levels of both organizations

Qualities

- Work together to manage program at executive level with flow down through customer organizations
- Jointly participate in governance board to manage project/funding decisions
- Jointly manage formal project reviews

Qualities

- Leverage technology strengths
- Technology roadmaps shared and developed
- Motivate innovation, leveraging and commitment through tech exchanges
- Expertise sought by other party for investment plan development

Sandia and Customer participate at all levels
Management and Funding Process

Executive Office
Program management

Executive Governance Board
R&D investment decisions

Sandia
Program management
Project oversight
Uses customer executive level funding for project execution

Sub Organization
Project management
Uses IR&D for project execution

3. Contract
4. Funding to Sandia
5. Project Execution

1. Proposal Development
2. Negotiation of project selection and funding

Chart Key
- Sandia
- Customer Executive Office
- Customer Sub Organization or Company