

## Summary of presentations

Joint Meeting of Florida Photonics Cluster (FPC) & Manufacturers Association of Central Florida (MACF) – at Lockheed Martin Missiles & Fire Control (LMMFC) -- September 25, 2014

“DoD Institute for Manufacturing Innovation (IMI) Update” -- Dr. Bahaa Saleh, Dean & Director, CREOL, The College of Optics and Photonics

- Several important programs are underway in optics and photonics
  - NPI: National Photonics Initiative. A collaborative alliance seeking to unite industry, academia and government to identify and advance areas of photonics critical to maintaining US competitiveness and national security. [www.lightourfuture.org](http://www.lightourfuture.org)
  - International Year of Light & Light-Based Technologies – 2015. A broad range of activities declared by the United Nations and supported worldwide by many organizations to promote light technologies for improved quality of life in developed and developing world. [www.light2015.org](http://www.light2015.org)
  - National Network for Manufacturing Innovation (NNMI). An interagency initiative made up of public/private partnerships devoted to manufacturing excellence through a network of research institutes developing and commercializing manufacturing technologies through public-private partnerships (industry, universities, and federal government agencies). <http://manufacturing.gov/nnmi.html>
  - National Technology Roadmap for Photonics (NTRP). A NIST-funded project led by the University of Rochester Develop to manufacturing technology roadmaps in 5 areas of photonics (optics, lasers, imaging/sensing, displays, and bio-photonics).
  - Photonic Systems Manufacturing Consortium (PSMC). A NIST-funded project led by the Massachusetts Institute of Technology to develop a roadmap for integrated photonics systems manufacturing.
- Institute for Manufacturing Innovation (IMI). A regional hub of manufacturing excellence, led by a nonprofit organization that brings together industry, universities & community colleges, federal agencies, & states.
  - Invests in applied research in industrially relevant manufacturing technologies with broad applications that accelerates innovation
  - Provides shared infrastructure assets and knowledge to help companies access cutting-edge capabilities and equipment
  - Creates an unparalleled environment to educate and train students and workers in advanced manufacturing skills
  - Leverages a minimum 1:1 non-federal co-investment
  - Can be self-sustaining
- CREOL’s response to the IMI - Multimaterial Integrated Microphotonics Institute for Manufacturing Innovation (MI3).
  - A new center addressing advanced manufacturing of multimaterial photonic integrated circuits, devices, and systems, including packaging, reliability, and testing and a resource for regional and national photonics companies, defense contractors, research centers, and small-business startups pursuing microphotonic technologies with diverse materials.
  - Principal hub to be located at the new International Consortium for Advanced Manufacturing Research (iCAMR) located in Osecola County, Florida – a 100,000 ft<sup>2</sup> 2-level state-of-the-art R&D lab/fab facility located on a new dedicated 220 acres research park. <http://icamr.net/>



## “LMMFC Overview” – Jeff Pridmore, VP of Technical Operations and Applied Research

- Lockheed Martin Corporation posted \$45.4B in sales in 2013, with \$7.8B at Missiles & Fire Control (MFC)
- The Mission of MFC is “To Enable Our Warfighters to Prevail in Their Defining Moments by Providing Superior Weapon Systems, Sensors, and Services”
- MFC’s customers include US as well as Allies in many countries (33% of MFC 2013 sales were to international customers)
- MFC has over 16,000 employees worldwide with 15 US locations (2 in Florida – Orlando and Ocala and 3 outside the USS). MFC has 6 business area products and services:
  - Tactical Missiles/Combat Maneuver Systems
  - Air & Missile Defense
  - Fire Control/SOF CLSS
  - Technical Services
  - LMUK – Amphill
  - Technical Operations and Applied Research



## Affordability -- Reggie Grant, Program Management Director

- Affordability is a “must” to stay sold and ahead of the competition. Everyone wants to make things less expensive – the tough part is figuring out how!
- The Affordability Dilemma:
  - Frequently, we are not given a clear affordability target
  - Internally we are creatures of habit
- Affordability at MFC:
  - Establish an affordability plan with clear objectives
  - Establish cost baseline
  - Get subcontractors involved early
  - Continue to address the trade space of alternatives
- Affordability prior to contract award:
  - Better partnership between business development, engineering and program management
  - Socialize tradable solutions with the customer
  - Develop capture affordability objectives with an eye toward execution
  - Early team communication and commitment
- Affordability after to contract award:
  - Update cost model
  - Flow the cost targets to IPTS and suppliers
  - Step down plans are defined and implemented
  - Measure step down plan performance
  - Cost step down risk must be captured
- Benefits Affordability brings to programs:
  - Improves competitive position
  - Brings focus to customer cost goals
  - Prevents unnoticed cost growth
  - Coordinates IPT efforts
  - Provides up-to-date progress status



## MFC – Orlando Manufacturing Overview, Rick Hulcher, Director, Production Operations

- In 2012, MFC received the Malcolm Baldrige National Quality Award from the US Department of Commerce.
- Orlando Operations has 6 manufacturing centers, employing 3,986 people working with 371K sqft of manufacturing space:
  - Machining Operations Center (MOC) – the MOC has a wide range of machine shop capabilities
  - Microelectronics Center (MEC) – MEC core capabilities include wafer fabrication, environmental screening & electrical test, hybrid & detector assembly, and hybrid & detector design
  - Fire Control Factory (FCF) - the FCF includes the Radar Data Link Center (RDLC) and Classified Integration and Test Center (CITC)
  - Optical Components Center (OCC) – the OCC has full capabilities for producing lenses, windows, mirrors, filters, and optical coatings and for performing needed optical metrology on components, supporting production, development, and research activities
  - Engineering Prototype Laboratory (EPL) – the Primary business of the EPL is to service IR&D projects & development programs, serving as a “one stop shop” for development through limited deliverable.
  - Printed Wiring Technology Lab (PWTL) – the PWTL capabilities include printed wiring board fabrication, failure analysis/rework, design review/guidance, and a variety of services such as etching, drilling, routing, plating.

