Welcome

to the

12th Annual

Systems Engineering Conference

Sponsored by

NDIA Systems Engineering Division

In Conjunction With

Director, Systems Engineering, Office of the Deputy Under Secretary of Defense (AT&L), Defense Research & Engineering

With Technical CoSponsorship By

Institute of Electrical & Electronics Engineers (IEEE)
Aerospace & Electronic Systems Society and
Systems Council

Systems Engineering

Why do we need systems engineering?

- **SE is the all-important facilitative umbrella engineering and “glue” that enables and fosters successful programs**
- **As the US military moves from a threat-based weapons procurement environment to a capability-based procurement environment, Systems Engineering becomes even more important.**

Capability-based Acquisition

- **The US was in a Threat-based mode for defense planning for 40 years, from the arrival of Robert McNamara as SecDef in 1961 until Donald Rumsfeld took over in 2001**
- **Analysts believe this led to two weaknesses:**
  - **Near impossible to do flexible and adaptive planning**
  - **Military planners became so narrowly focused that they missed potential dangers**

Gulf War was a surprise
Kosovo was a surprise
Sept 11, 2001 was a surprise
Iraqi insurgency was a surprise
Taliban revival was a surprise

Capability-based Acquisition

- In a recent RAND report, analyst Paul Davis observed that whatever its faults, capability based planning has the virtue of encouraging prudent worrying about potential needs that go well beyond currently obvious threats
- Capability-based Planning, and Acquisition, needs **competent systems engineering**---and this is what this Conference and the NDIA Systems Engineering Division – is all about.
- ---And unfortunately, our DoD Systems Engineering Capability has atrophied to a large degree

Dual-track Acquisition System

- To further exacerbate the problem, the recent (summer 2009) DSB Report on “Fulfillment of Operational Needs”, chaired by former AT&L Jacques Gansler, has recommended a dual-track acquisition system: the traditional force structure path and a quick-response path to rapidly answer demands for new kinds of equipment.
- According to the cover letter, the Pentagon “lacks the ability to rapidly field new capabilities for the warfighter in a systematic and effective way.”
- ***Such a rapid-response system will have need for competent systems engineering***

A few thoughts---

- **Do we need a 6th-generation fighter?**
  - **Gen 1: Jets – F-80, ME-262**
  - **Gen 2: Swept-wings, range-only radar – F-86, MiG-15**
  - **Gen 3: Supersonic speed, pulse radar, target acquisition beyond visual range – F-105, F-4, MiG-17, MiG-21**
  - **Gen 4: Pulse-doppler radar, high maneuverability, look-down, shoot-down missiles – F-15, F-16, Mirage 2000, MiG-29**
  - **Gen 4+: High agility, sensor fusion, reduced signatures - Su-30, F-16+, F/A-18, Typhoon, Rafale**
  - **Gen 4++: Electronically active scanned array radar, "active" waveform-canceling stealth, some supercruise – Su-35, F-15SE**
  - **Gen 5: All-aspect stealth, internal weapons, extreme agility, full-sensor fusion, integrated avionics – F-22, F-35**
  - **Potential Gen 6: Extreme stealth, efficient in all flight regimes (subsonic to multi-Mach), smart skins, highly networked, extremely sensitive sensors, optional manning, directed energy**

A few statistics---

- **Some USAF analyses claim that the USAF could be as many as 971 aircraft short of its minimum required inventory of 2,250 fighters by 2030.**
- **Who built our military airplanes? By WWII:**
  - **7,890 by Chance-Vought**
  - **8,810 by Martin**
  - **13,575 by Bell**
  - **15,603 by Republic**
  - **17,428 by Grumman**
  - **18,381 by Boeing**
  - **26,154 by Curtiss**
  - **30,696 by Douglas**
  - **30,903 by Consolidated Vultee**
  - **41,188 by North American**

A few more statistics---

- **Ops Tempo is high!**
  - **USAF flew 18,422 sorties in Iraq in 2008**
  - **Approximately 9,000 projected for 2009**
  - **USAF flew about 19,000 close-air-support sorties in Afghanistan in 2008**
  - **Number will double in 2009**
  - ***Sustained high Ops Tempo wears out aircraft!***
- **Despite recent program cuts, we will be designing and fielding new equipment, and competent systems engineering will be needed for this.**

And a few historical items---

- **October 2009 is the 50th anniversary of the first US InterContinental Ballistic Missiles**
  - **3 long-range, liquid-fueled ATLAS D missiles, armed with nuclear warheads, went on full combat alert at Vandenberg AFB, California, on October 31, 1959**
  - **Development took 14 years**
- **The first Combat Drones – Unmanned Air Vehicles – were deployed over North Vietnam in August 1964**
  - **Drones were manufactured by Ryan Aircraft in San Diego**
  - **They were dropped from C-130 aircraft**
  - **Performed surface-to-air missile recon over N. Vietnam**
  - **Drones recovered near Da Nang Air base**
    - **Engines commanded to shut down**
    - **Parachute deployed**
    - **Helicopter snagged the chutes and drones mid-air**

Program - Tuesday Oct 27

0815 - 1200 PLENARY SESSION **Bayview Ballroom**

0840 – 0930: Keynote Address

Hon Zachary J. Lemnios, Director, Defense Research & Engineering

0930 - 1000 COFFEE BREAK **Regatta Pavilion ("Tent")**

1000 - 1200: Acquisition Executives Panel:

Mr Terry Jaggers, OUSD(AT&L)DDR&E/SE, Principal Deputy

Moderator

Mr David Ahern, Director, Portfolio Systems Acquisition, OUSD(AT&L)

Mr. Thomas E. Mullins, Deputy Asst Secretary for Plans, Programs & Resources, OUSD(AT&L)

Mr. Christopher A. Miller, PEO for Command, Control, Communications, Computers & Intelligence, US Navy

Mr. Randall G.Walden, Director, Information Dominance Programs, SAF-AQ

Program - Tuesday Oct 27

1330-1515 PLENARY SESSION **Bayview Ballroom**

Test & Evaluation Executives Panel: View From The Top: How Can Systems Engineering Support Test & Evaluation

1515 - 1530 COFFEE BREAK **Regatta Pavilion("Tent")**

1530-1715 PLENARY SESSION **Bayview Ballroom**

SE and Acquisition Reform: The Way Ahead

1730-1900 Reception in Displays Area **Regatta Pavillion**

Luncheon Activities

Lunches in Regatta Pavilion

Tuesday

Mr. Stephen Welby, Director, Systems Engineering,
OUSD(AT&L)DDR&E

Wednesday

- Presentation of NDIA Lt Gen Thomas Ferguson Awards for Excellence in Systems Engineering

Individual (Leadership & Practitioner) & Group

- Presentation of DoD Top 5 Programs Awards

Thursday

Networking Lunch

Program - Wednesday Oct 28

0800-0945

1 Systems Engineering Effectiveness	Bayview III
2 Early Systems Engineering	Bayview II
3 Technology Maturity	Bayview I
4 Test & Evaluation	Mission I
5 Human Systems Integration	Mission II
6 System of Systems	Mission III
7 Program Management	Palm I
8 Net-Centric Operations/Interoperability	Palm II
0945 - 1015 COFFEE BREAK	**Regatta Pav.**

1015- 1200

All above continue, except Track 5 is System Safety - ESOH

1200 - 1330

Awards Luncheon in Displays Area **Regatta Pav**

See Program Brochure for Wednesday PM and Thursday sessions

Some Logistics Info---

Displays & Coffee Breaks are in Displays area in Regatta Pavilion. 17 Exhibitors are there to discuss their capability in Systems Engineering

Lunches are in Regatta Pavilion

And Special Thanks To---

Technical Program Chairs:

Steve Henry, Northrop Grumman
Dr. Tom Christian, USAF AFMC/ASC

DoD Partners:

Stephen Welby, Terry Jaggers, Jim Thompson, Kristen Baldwin, Nic Torelli, Chris DiPetto, and Dona Lee

Session & Track Chairs:

WAY too many to list, visit with them in the sessions-

NDIA Meeting Executive:

Suzanne Havelis

NDIA Director

Sam Campagna

Promotional Partners

Parametric Technologies Corp (PTC)
University of Phoenix
Lean Solutions Institute

13th Annual Systems Engineering Conference

October 25-28, 2010

Hyatt Regency Mission Bay

San Diego California

Call for Papers & Call for Displays is in your registration information

Papers Due Date: May 30, 2010