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International Cooperation on Space Technology Initiatives

November 8, 2012

**2012 Beijing Space Sustainability Conference
Beihang University - - - Secure World Foundation**

Jim Grady, Global Enterprise Initiative, LLC



Global Enterprise Initiative, LLC

Introduction

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> GEI's main offices are located in the NASA Research Park (NRP)* adjacent to the NASA Ames Center in California's Silicon Valley:



> GEI engages in advanced technology enterprises including space technology, communication technology, information technology, biotech, energy tech, green tech, and others. This involves cooperation with Silicon Valley industry, universities, the venture capital community, and other organizations, locally and around the globe.

> GEI includes people (employees, partners, associates, etc.) at or near the GEI offices in Silicon Valley and people at key locations around the globe, including:

- Asia, Middle East, and Europe
- also, as needed, Canada, South America, Africa and other areas.

*Note: Activities of GEI (and other companies at the NRP industry park) are independent of NASA but could result in products and services benefiting NASA.



TRACE Certificate

Vetting by an independent organization such as Trace International is becoming essential for support of international business development.

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The internationally recognized membership association working with companies to raise their anti-bribery compliance standards

THIS CERTIFIES THAT

Global Enterprise Initiative, LLC

HAS COMPLETED A TRACE BACKGROUND REVIEW

AND IS A MEMBER IN GOOD STANDING

15 December 2011 - 14 December 2012

ALEXANDRA WRAGE, PRESIDENT



WWW.TRACEINTERNATIONAL.ORG

Note: GEI has recently completed TRACE certification for 2013.



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Example of Space-Related International Business Development in Norway

Kongsberg (the major aerospace company in Norway) and a U.S. company formed a joint venture to develop the Svalbard satellite ground station on Spitsbergen Island. The business case for the enterprise included potential “anchor clients” such as NASA and other organizations needing a polar ground station essential to satellites in polar orbit viewing indications of climate change, disaster monitoring, and performing other global environment related missions. The U.S. company sold its interest to Kongsberg and Kongsberg Satellite Services (www.ksat.no) now operates the ground station.





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Example of Space-Related Offset Project Malaysian Astronaut to ISS

As an offset project for the Sukhoi jet, the Russians flew a Malaysian astronaut to the International Space Station. Also included was support of Malay science hardware companies, student participation, etc.

First Malaysian Astronaut To Visit Space Station

The Malaysian and Russian governments have agreed to send Malaysia's first astronaut to Russia's section of the international space station in late 2007 as part of a contract offset relating to the Royal Malaysian Air Force's purchase of Sukhoi fighter aircraft. Russia's Rosoboronexport



(Article in Space News)



Examples of Sources of Support for International Space Technology Initiatives

Venture Capital

- E.g: Silicon Valley venture capital (VC) community and/or other VC sources in many global locations
- VC business development support is often more important than VC financial support; the VCs have their own “skin in the game” and are therefore often more motivated than (for example) government agencies giving out grants.

Government Grants

Educational support grants

Grants for development of otherwise unsupported technology

Grants from International Organizations

Philanthropic pursuits and other worthwhile causes.

Offset (also known as Industrial Participation, Industrial Cooperation, etc.)

- Financial, technical, and business development support from major contractors (e.g.: Boeing, EADS, Caterpillar, etc.)
- \$.5 Trillion in offset by 2016 (now ~\$.2T), see next Chart.
- Offset is not well understood in China or in the U.S.



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Increased use of Offset for Space Technology Initiatives

- Offset (or industrial participation, etc.) is discussed at www.strategicoffsets.com, a website associated with Avascent and Fleishman Hillard, and at other websites such as www.globaloffset.org.

- **A definition of offset:** offset occurs when a government makes a purchase from a foreign contractor and the contractor is required to provide compensation (typically projects) for the perceived loss to the economy of the purchasing country. **Offset inherently involves international cooperation.**

From www.strategicoffsets.com

in 2012 (in 2012) an estimated **\$214B** in offsets have been obligated but remain undischarged

by 2016 (by 2016) that number is expected to approach **\$500,000,000,000**

THE HALF-TRILLION DOLLAR CHALLENGE
Designing Offset Strategies to Build Reputation, Promote Development

AVASCENT FLEISHMAN HILLARD

- *China does not yet have an offset policy.
- *The U.S does not have an offset policy but has “Buy America”, the Jones Act, the Berry Amendment, etc. which are effectively the same as offset
 *hence offset is not well understood in China or the US
- Most major trading nations have an offset policy for purchases greater than about \$10 million.
- Many object to the concept of offset. However, until the world is a “free trade utopia”, it is better to have offset than any of the likely alternatives. Also it has been argued that offset is a “necessary condition” for trade among enterprise based democracies like the U.S. and most of its trading partners.
- Since offset is a “fact of life,” offset should be used more for worthwhile causes such as environmental or educational related projects, or for projects involving business enterprise cooperation between adversarial nations. **Peaceful space technology projects would also represent worthwhile causes.**
- Contractors with offset obligations support projects with relative enthusiasm providing financial support, technical support, and marketing, and other business development support, for one reason they want to win the next contract from the customer country.

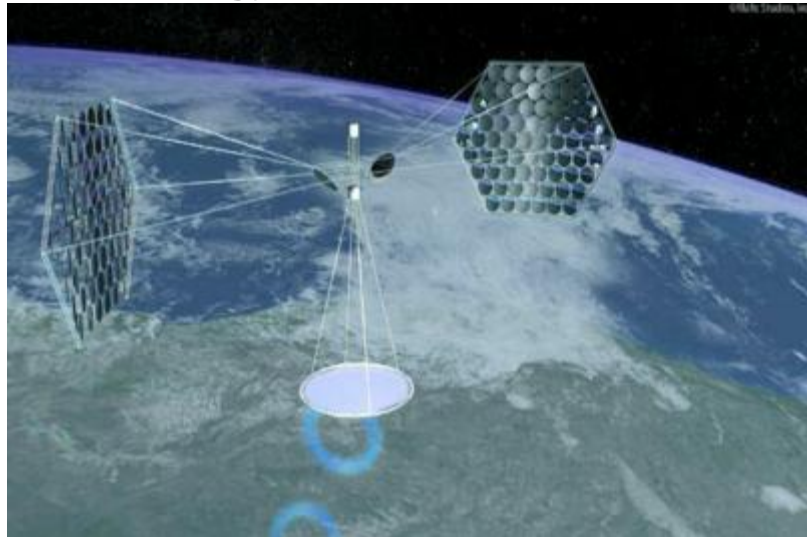


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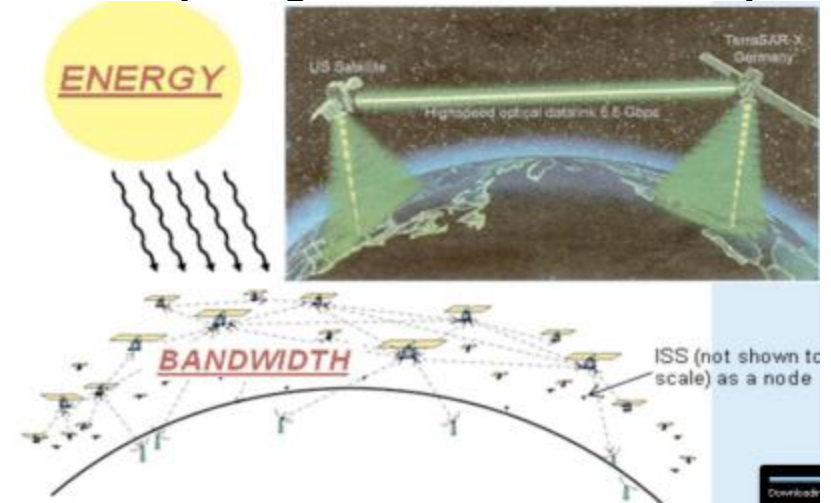
Examples of Potential Areas for International Cooperation in Space

(Chart 1 of 2)

Green Energy; Space Based Solar Power



Green Computing; On-orbit Cloud Computing



Space Tourism/Orbital or Suborbital (vehicles shown below exemplify potential candidate vehicles for space tourism)

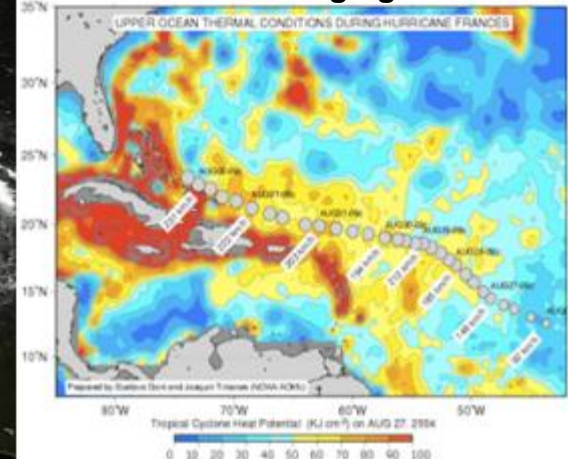


Ocean Monitoring

Radar Imaging



Thermal Imaging



Examples of Potential Areas for International Cooperation in Space

RF Spectrum Mapping



Microgravity Integration

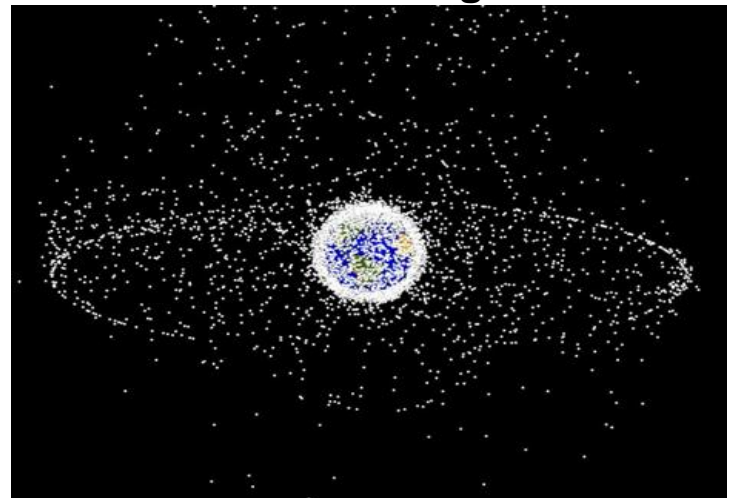


Low Cost Launch

(vehicles shown below exemplify potential candidate vehicles for low cost launch)



Space Situational Awareness and Debris Mitigation



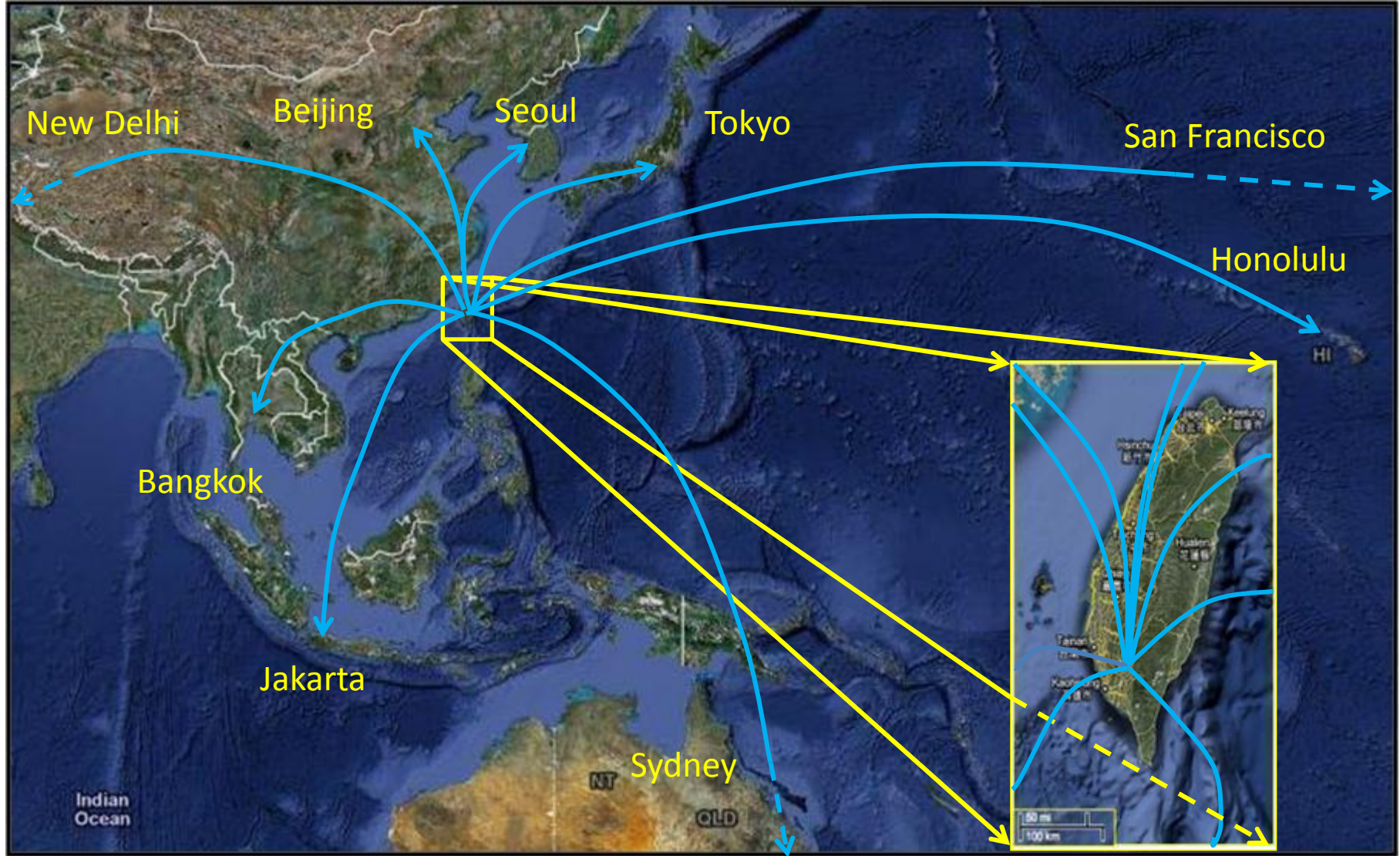


Potential Spaceport Project

Concept developed by Brenda Chang, a student intern.

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Point to Point (P to P) destinations.
Long distance P to P space tourism definition/development is underway.





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Silicon Valley Innovation Center (SVIC) for China; Emphasis on Space Technology

- The Silicon Valley Innovation Center (SVIC) will provide marketing support and business development opportunities taking advantage of the Silicon Valley high tech “gateway”.
- Aerospace products and other defense and high-tech products will benefit from potential technology transfer, partnerships with local technology companies, etc.
- SVIC can be a model for other key global locations (Shanghai, Singapore, etc.).

- Silicon Valley is known for bio tech, info tech, clean energy tech, and other high tech ventures.
- SVIC can be used to bring Silicon Valley support for offset projects as well as create an international markets.
- Sand Hill Road in Silicon Valley is called the venture capital (VC) “capital” of the world. The VC industry is, of course, a key reason for the existence of Silicon Valley, and represents an opportunity for innovative leveraging of venture capital, offset resources, marketing and related business development support.



Google: info tech



NASA Ames, Moffett Field



Sand Hill Road, venture capital industry



Bloom Energy: energy tech

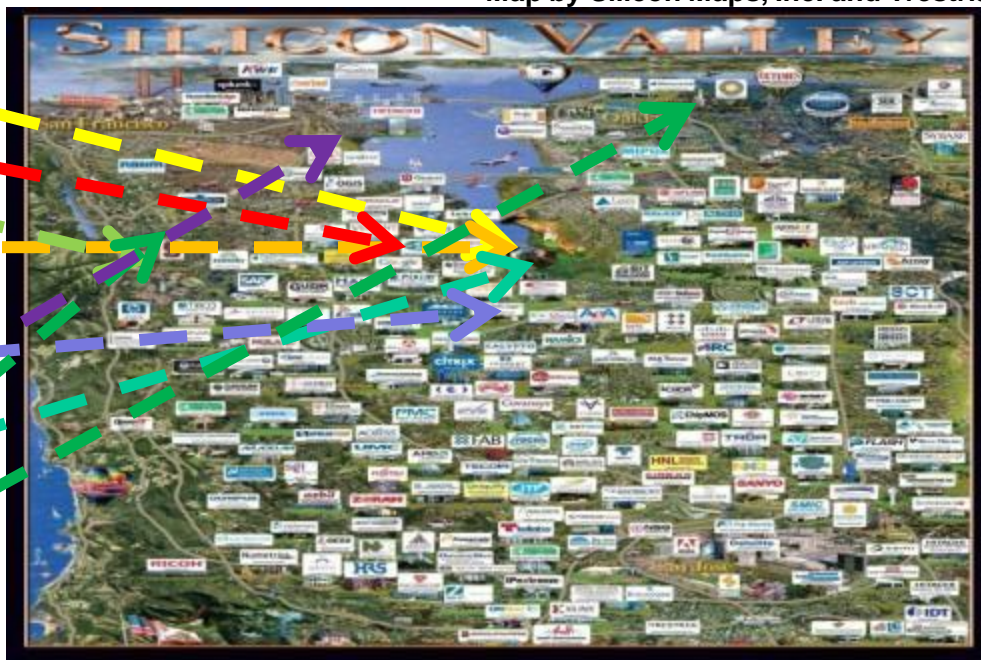


Lockheed Martin: space tech



Universities

Silicon Valley High Tech Industry Examples



Map by Silicon Maps, Inc. and Trestria



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Silicon Valley Innovation Center(SVIC) for China, examples of potential locations. Many other locations are available.

Current GEI Offices



Potential SVIC Location #1
625 Ellis St.



Potential SVIC Location #2
465 Fairchild Drive



900-4000 sqft



3rd Floor – 8874 sqft,
2nd Floor – 175+ sqft

Potential SVIC Location #3
320 Logue Avenue



400-800+ sqft



Silicon Valley Innovation Center (SVIC), for China Would Build Upon Other Chinese Related Efforts in the Silicon Valley

- Chinese related efforts include:



And the **China-US Technology Association** (ChinaUSTech),
The **Chinese Enterprise Association**,
The **Chinese Information and Networking Association** (CINA),
The **Chinese Software Professionals Association**,
The **Hua Yuan Science and Technology Association**,
And **Others**

- **The Silicon Valley Innovation Center for China would have
a space technology focus.**



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BACK-UP CHARTS



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International Offset

Definition/Terminology

- **Definition of Offset, by an international seller and buyer, the British government: “. . .offset is the term used to describe the situation where, in the event of an overseas procurement . . . , the seller is required to compensate the buyer for a perceived loss to the economy of the purchasing country.”**
- **Offset is required for most large sales to foreign governments.**
- **Other terms used for offset and related nomenclature:**
 - **Industrial Cooperation is used by Norway, Chile, etc.**
 - **Industrial Participation is used by UK and other countries**
 - **Counter Purchase, Countertrade, Industrial Coproduction are also terms related to offset**
 - **Direct (directly related to the contract) offset, indirect offset, etc. The space-related projects in the following two charts are examples of indirect offset (not related to the contract)**



Some Opinions About Offset

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- **The U.S. does not have a formal offset requirement for imports; but countries importing to the U.S. claim that current U. S. import requirements (the Jones Act, “buy America”, the Berry Amendment, etc.) are much more difficult than offset.**
- **Examples of U.S. “import requirements” (or the “informal” U.S. offset policy) included the need for UK Harrier jump-jets to be manufactured in Missouri (not the UK) and the proposal by EADS for assembly of U.S. Air Force tankers in Alabama (plus significant Airbus tanker work in many other states) in the recent competition that was won by Boeing. These examples, and others, have provided support to the idea that the U.S. should have a formal offset policy instead of its current “informal” offset policy. One argument is that a formal U.S. offset policy would help quantify jobs and other economic improvements resulting from large purchases from foreign countries. (EADS example shown on next chart)**
- **Many object to the concept of offset. However, until the world is a “free trade utopia”, it is better to have offset than any of the likely alternatives. Also it has been argued that offset is a “necessary condition” for trade among enterprise based democracies like the U.S. and most of its trading partners.**
- **Since offset is a “fact of life,” let’s use offset proactively for worthwhile causes such as environmental or educational related projects, or for projects involving business enterprise cooperation between adversarial nations. Note: peaceful space projects or other high tech offset projects could also represent worthwhile causes.**

EUROPE
U.K. Firms Fight Profit Cuts
British industry is fighting back as the MoD looks for all possible ways to trim costs. Page 4

4 Finland may use MURS upgrade.
22 NATO members \$1.3B in projects.
34 Turkey Sikorsky offers offset bonus.

THE AMERICAS
ISR Offices Merge
Contract with getting gear quickly as U.S. troops, independent task force is meeting with DoD's deputy secretary for intel. Page 30

62 U.S. Air Force ship upgrade diverted.

ASIA & PACIFIC RIM
A New Tack?
China may adopt new approach to South China. Successes at opening BRAC Defense Ministers Meeting this night. Page 16

38 India now about one with Russia.

INTERVIEW
Jean-Marie Poinbeauf
Chairman of France's GICAN defense industry association says country's naval sector faces uncertainty beyond today's order books. Page 66

SPECIAL REPORT
U.S. Budget Outlook
Biological battles stall spending bills. Page 17

Italy Plans 3 Military Offices To Surrender Buying Power
By TOM KINGTON

ROME — Italy's Ministry of Defense is promising faster procurement and less red tape-prose procedure after it overhauls its contracted acquisition operation.

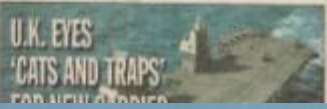
Officials say their plan, which this month being escalated by Italian parliament, will bring into line with other European countries, promote stronger cross services, and save money — though no one would put a price tag on it.

Based on a March 15 decree by the Italian cabinet, the plan will place responsibilities under the control of the Ministry of Defense's procurement office. Initially, a large share of the contract is undertaken by major, Navies and Terrains, smaller procurement offices serving the Air Force, Navy and Army respectively.

S. Korea Exp
By JUNG SEUNG-IL

SEOUL — South Korea is seeking to boost and diversify its arms exports by strengthening international defense ties, especially countries in the Middle East, Africa, South America and Asia.

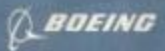
On Sept. 20, South Korea's Defense Acquisition Program Administration (DAPA) signed a memorandum of understanding (MoU) with Colombia to cooperate in defense science and technology. Under the agreement, which follows a May 2



REAL FACTS. REAL ADVANTAGE.

	Boeing NewGen Tanker	EADS/Airbus A330 Tanker
Proven Experience	2,000+ Tankers Delivered 1,000+ With Refueling Booms	8 Tankers Delivered 0 With Refueling Booms
U.S. Designed and Built	Yes	No
Total Cost of Ownership	Billions Less	Billions More
More Booms in Air from Any Base	Yes	No

When you look at the facts, it's easy to see which tanker delivers the most capability to America's warfighters and the most value to America's taxpayers. The Boeing NewGen Tanker. Right tanker, right choice.



Boeing add, pg. 5

EADS add, pg. 15

48,000 Americans are ready to build this plane

When the United States Air Force selects the EADS North America KC-45, 48,000 Americans will get to work building the most capable tanker in the world — right here in the U.S.

That's because the EADS North America KC-45 is the only aerial refueling tanker in the KC-X competition that meets Air Force requirements and is real, proven and flying today.

Real American Tanker. Real American Jobs.
www.KC-45now.com

Note: the EADS "offset" proposal to the U.S.A.F. included a factory in Alabama and significant work in many other states, as reported by EADS at offset conferences.



See video of actual refueling operations at www.KC-45now.com





The Growing Importance of International Offset

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- **30 Years ago about 10 countries had offset policies. Today over 100 countries have offset policies.**
- **According to offset associations (GOCA, DMA, DIOA, etc.), offset now accounts for an estimated 10% to 15% of world trade; i.e.: about 1 Trillion Dollars/year (based on world trade at ~\$8T/year).**
- **Offset costs (to sellers) are increasing: from ~2% or ~3% of contract value to ~4% or ~5% or more in some areas; i.e.: at 4%, \$40M is budgeted for offset for each \$1B of contract value.**
- **Offset is becoming mandatory in international competitions; no offset = no sale.**
- **International trade is growing; “... go global or go broke ...”**
- **Most people in U.S. are not familiar with offset because U.S. does not have a formal offset policy. Most countries have formal offset policies, including almost all U.S. trading partners.**

White House Initiative on “Big Data” and other agencies

Space offset projects, involving value added processing, including processing of large amounts of imaging data and other data could complement and take advantage of the “Big Data” initiative.



The White House announced a 2012 “Big Data Research and Development Initiative.” This initiative “promises to transform our ability to use Big Data for scientific discovery, environmental and biomedical research, education, and national security.” (Office of Science and Technology Policy, OSTP)



Potential South Korea Spaceport

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- A non-profit educational and research entity established in the city of Yecheon-gun, state of Gyeongsangbuk-do, South Korea.
- The Center is home to an astronomical research center that houses a collection of research telescopes, auxiliary telescopes, and other research apparatus; a space camp training center with centrifuge, aerial rooftop training device and reduced gravity simulators; a planetarium; a conference center and dormitories; and a helicopter tour operation.
- XCOR was selected for suborbital operations, space tourism, educational, scientific and environmental monitoring missions.



OffThe Yecheon Astro Space Center selected XCOR Aerospace as its preferred supplier of suborbital space launch services. Operating under a wet lease model, XCOR intends to supply services to the Center using the Lynx Mark II suborbital vehicle, pending United States government approvals to station the vehicle in the Republic of Korea.



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Potential use of new airport as a horizontal space launch site

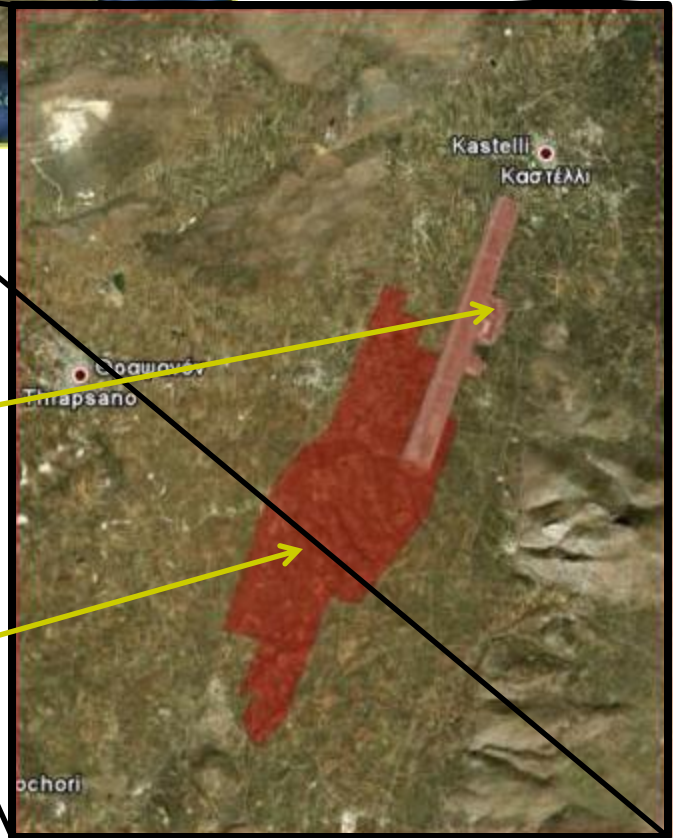


The Greek Island of Crete

- The airport will cost 1.2€ billion for construction
- Existing International airport of Heraklion will be given back to public lands and made into a large urban area (278 hectares (687 acres)).

Old military airbase that is being rebuilt as new terminal and runway.

New land (600 hectare plot).





Spectrum Mapping (SM) Small Satellite Commercial Space Initiative

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Google Earth, GeoEye, Digital Globe, etc. represent the commercialization of "I-lint" (imagery intelligence); Spectrum Mapper offset project could be considered the commercialization of "E-lint" (electronic intelligence*).

One of many ways to show SM data: mobile phone reception using Google Earth



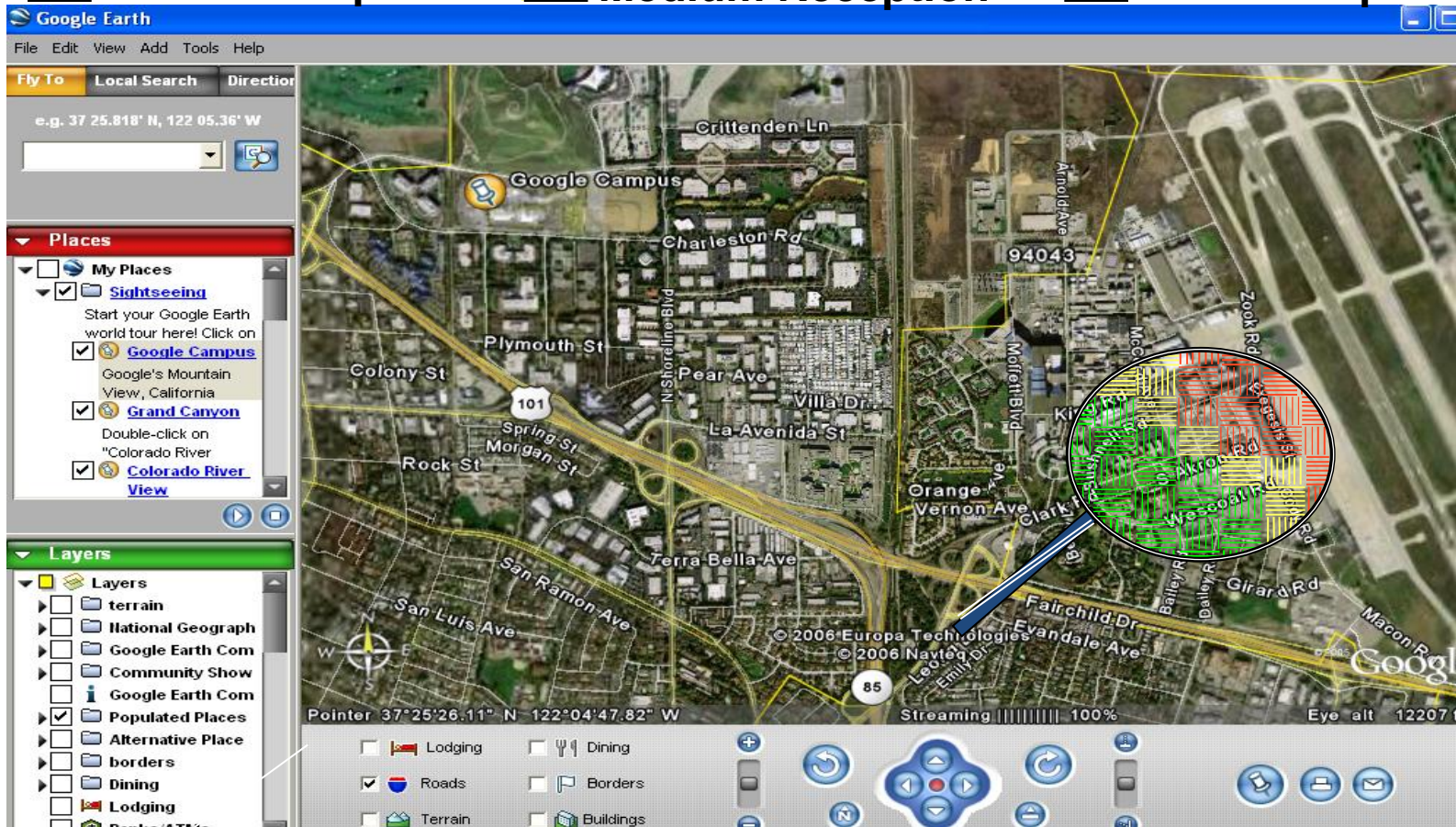
Good Reception



Medium Reception



Poor Reception



*Note: E-lint is an older term, now often replaced by comlint, siglint, etc



Offset Conference Examples

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FALL 2006, October 9-11
Lake George, New York.

Winter 2007, December 6-7, Asia
Regional Offset Conference DMA-GOCA
Langkawi, Malaysia

Winter 2008, February 12-13
Joint CII-DMA-GOCA Conference
New Delhi, India

Summer 2008, September 21-22, 2008
European Offset Conference
Bucharest, Romania

Fall 2008, October 13-16, 2008
Coeur d'Alene, Idaho

Spring 2009, May 13-16, 2009
Spring Offset Conference
Las Vegas, Nevada

Fall 2009, October 12-15, 2009
Hilton Head Island, South Carolina

Spring 2010, April 25-28, 2010
GOCA Spring Offset Conference
Budapest, Hungary

Summer 2010, June 3, 2010
Netherlands Offset Conference
Amsterdam, the Netherlands

Fall 2010, September 13-16, 2010
Fall 2010 Offset Conference
Chicago, Illinois

Winter 2011 February 14-16 Abu Dhabi , UAE

Spring 2011, April 10-13, 2011
Spring Offset Conference
Amsterdam, the Netherlands

Spring 2012, Izmir, Turkey