

IGS 10th Anniversary Symposium, 3rd March 2004 Bern, Switzerland

**INDUSTRY PERSPECTIVES ON IGS
COLLABORATION, IMPACT AND INFLUENCE –
PAST, PRESENT AND FUTURE**

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Introduction

- IGS Collaboration - Impact and Influence
- The PAST
 - the PRESENT and
 - the FUTURE

An Industry Perspective

The PAST

- **Interaction with Industry has had successes:**
 - Survey - Large geodetic frameworks used Data & Products.
 - Aviation - Meteorological applications and uses.
 - Telecoms - The Timing Community and it's needs.
- **The IGS did not initially target Industry.**
 - Technical Parameters whereas Industry needs were different

Supply, Use and Interaction rather than Collaboration

The IGS Influenced Industry

- **1989:** Edinburgh, IAG congress. The concept that fiducial sites could control large geodetic networks for inter-continental schemes was first appreciated.
- **1990-1993:** For Control Sites in Geodetic campaigns we had to visit VLBI/SLR sites e.g. Unsala, Wettzell, Matera etc. A costly and time consuming process.
- **1994-2003:** The introduction of Services (Data & PE) enabled the International campaigns to be undertaken much more cost effectively.
- **2000+:** Use and agreements with Members for the supply of services and products. The move to Real-Time services.

Common Influencing Factors

- **1990's: Improved access to Dual Frequency GPS with affordable receivers and antennas.**
- **1990's: The Internet.**
- **2000: The removal of SA prompted interest in stand alone solutions and high accuracy solutions.**
- **2003: Galileo gets approved (by Europe).**

What has Been Significant?

- For Industry, the ability to develop regional augmentation systems on the basis of precise reference frameworks.
- The IGS created a market for high precision Products.
 - Reliance upon such products increased.
 - Organisations now try to offer a local capability.
- The IGS have demonstrated the deliverables are sustainable.
The above offered opportunities for Industry
- Developments in hardware and systems.
- Increased development, acceptance and use of high accuracy solutions.

The PRESENT

- Single Point Co-ordinate Solutions and Long Range Geodetic networks updated with PE Data & Products.
- Increased use of the Bernese software product.
- Real Time High Accuracy services adopting Global Error Modelling (Wide Area) techniques.
- Galileo continues to offer new experiences.
- Bilateral Service Level Agreements in place between Members and Industry becoming more common.
- Applications - Subsidence Monitoring - a Partnership between Industry and IGS members (Academia).

Overall the real collaboration is relatively small

INDUSTRY – The Requirements

Example:

**Deep Sea survey & exploration
using Autonomous vehicles**

- Initialisation for alignment, attitude as well as 3D/4D position.
- Annually 1-5mm over 5-10+ years
- Availability – When the AUV surfaces.
- Integrity, Reliability and Continuity of Service – Through QC.
- Customer Service and Support.
- New GNSS?



The IGS Value Chain

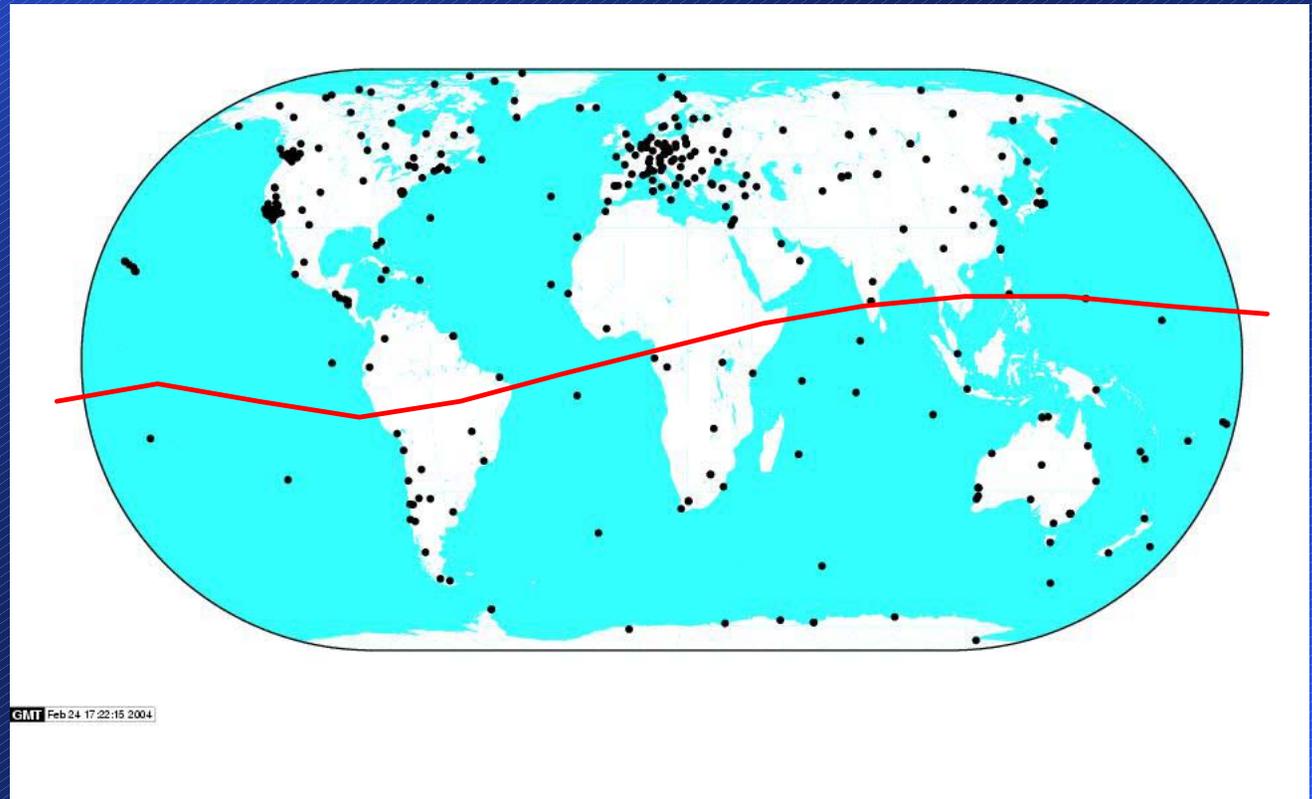
	DATA	PRODUCT	COMMS	REAL TIME	HARDWARE	CUSTOMER SERVICE
IGS	Y	Y	Y	--	--	Y
Industry	Y	Y	Y	Y	Y	Y
IGS Position	No 1	No 1	No 3	(No 4)	--	No 3

IGS – The FUTURE

- **The IGS Data, Products and Services**
 - Data - could Real Time systems replace the need?
 - Products - continue to be used but will performance be accepted without clear QC?
 - Services - is the IGS Scientific or Commercial?
E.g. How will the station coverage continue to grow and why?
- **Industry could collaborate**
 - What are the reasons this may or may not happen and how does the IGS influence this?
 - Issues of Real Time, Communications & Service Levels
- **Collaboration would be “win win”.**

Consider Sites 2003: Site Selection Strategy

- Where is the infill in the Tropical regions?
- Are the Costs versus Benefits acceptable?
- Reliability and quality must be preserved.
- Can the IGS maintain this?
- The Influence of Galileo?



The FUTURE....

- The IGS could review how it is structured and formed as a legal or contractual entity.
- Is Funding secure?
- A clear strategy would allow Industry to understand the direction the IGS is taking.
 - E.g. Is site selection based upon a collective (IGS) need or a member funding capability?
- Alternative collaborations could be investigated
 - The World Meteorological Organisation(WMO) or another UN or Non Government Organisation (NGO).
- The arrival of Galileo should introduce some new elements to the situation:
 - New Sites, Observation selection and the reduced need for Data

FACTORS INFLUENCING IGS & INDUSTRY

The IGS function

- Recognised
- Included
- Expanded
- Accepted

Industry View

- Added complications
- Value not clear



Future Collaboration

- The IGS or it's Members could encourage Industry to support the introduction of new sites.
- New GNSS systems shall impact on both IGS & Industry.
 - By collaboration and communication, duplication of effort can be avoided.
- Industry accept that there is no contract for current activities however for future needs an alternative source may be created.

The IGS Future

- **Continue to Monitor & update co-ordinate frameworks.**
- **New generations will require Training:**
 - the significance of dynamic earth models and Epoch based Datums.
- **For new GNSS systems the IGS will be involved in ensuring they are “honest”.**
- **The IGS still has work to do – Atmospherics, Galileo**
- **Active collaboration via ownership**
 - Acts under an umbrella organisation - The IAG, the World Meteorological Organisation (WMO) or another UN, or Non Government Organisation (NGO). Does GEO fit this?
- **IGS to provide a Single Source for information**
 - Papers, Practical Knowledge, Distance Learning Modules, QC, Research

Summary

- The IGS has developed a robust and well respected series of data and product services.
- Industry has been slow to appreciate their importance and build upon the work. It's improving.
- Galileo may, by design, offer solutions compatible with future Real-Time Industry needs.
- The Scientific research will still be required for atmospheric, timing and geodesy.
- Without a clear strategy and an ability to form a contract, Industry will remain, at best, slow on the uptake, at worst, competitors.
- The IGS can remove the threat and strengthen it's position with a slight shift in emphasis.

To Conclude

Wm. Shakespeare's Henry IV stated:

“Past and to come seems best; things present, worst”

But the IGS is not at it's worst so....

The IGS will have a strong 10 years ahead.