

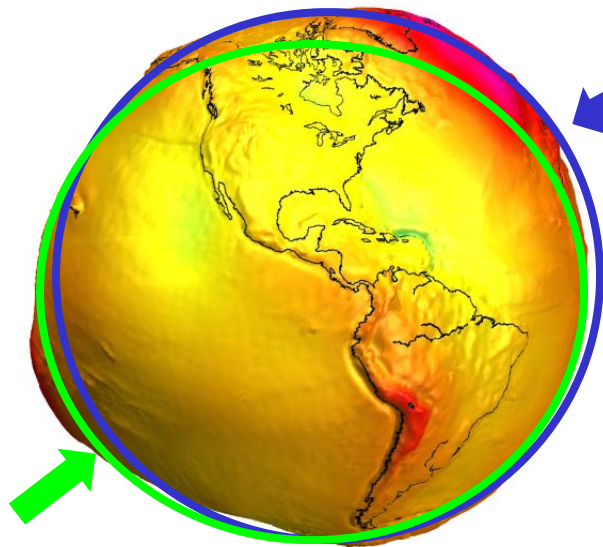
**"Our Profession: Today and the Next Five Years"**

**Jack Verouden**  
**Outgoing Chairman OGP Surveying & Positioning Committee**  
**and Shell Chief Surveyor**



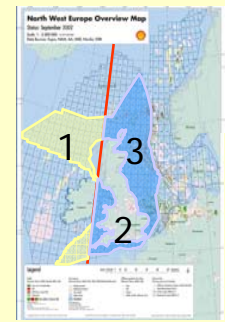






## Licence boundary definitions

- no ambiguity permitted
- ⇒ legal implications!!



## Seismic

- ⇒ compatibility of datasets

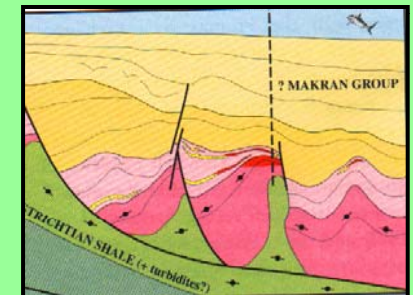


## The irregular earth:

- multiple approximations
  - optimised locally, regionally, or globally
- ⇒ 500+ different Reference Systems
- ⇒ impact: several hundreds metres 'fuzziness' of latitude, longitude
- ⇒ 1500+ map projections
- ⇒ 1500+ transformations between Reference Systems
- Managed in the Geodetic Registry

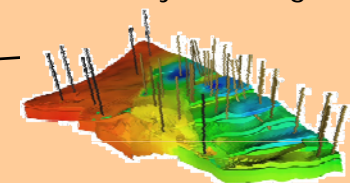
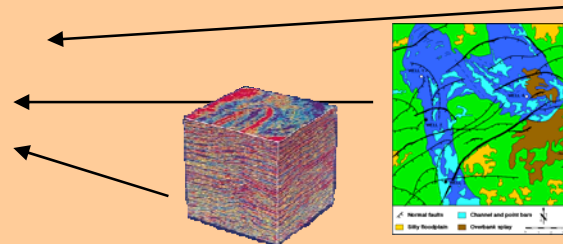
## Drilling

- ⇒ Safety!
- ⇒ Compatibility with seismic



## Reservoir modeling

- synthesis of large number of different datasets
- ⇒ increase model resolution of model by ensuring compatibility of datasets



# S&P Committee Charter



Surveying, positioning and coordinate management activities affect virtually all stages in the Exploration and Production lifecycle. Managing these issues correctly is important:

**Safety and the environment:** the safety of operational activities and the protection of the environment depends on the accuracy of surveying and positioning, and the reliability of coordinate data and mapping.

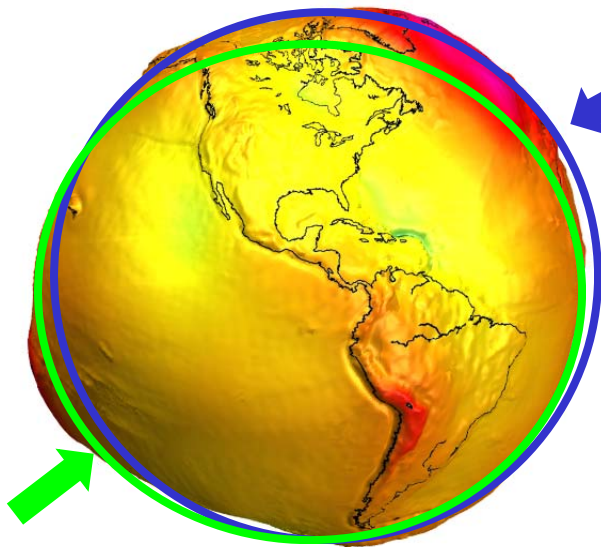
**The business:** with some 80% of upstream data involving spatial or geographical components, these are the foundation on which sound business analysis and decisions are made.

**Legal issues:** incorrect coordinate data may have implications for license agreements, relinquishments, unitisations and activities adjacent to concession and international boundaries.

# S&P Committee 'Silver Ware'



1. EPSG Geodetic Parameter Dataset (EPSG database), the de-facto standard in the Oil & Gas Industry and beyond for geodetic parameters worldwide.
2. Ten Guidance Notes published on OGP website (free download).
3. Owner of five UKOOA and SEG Positioning Standards. Published on OGP website (free download).
4. Active Global Survey & Positioning Committee.
5. Active Global Geodesy Sub-Committee.
6. Mechanism and energy for Joint Industry Projects : Geodetic Registry and GIGS
7. Effective co-operation with SEG, APSG and IMCA



## Licence boundary definitions

- increasing complexity due to more 3D definitions and overlap with other legislation



## Seismic

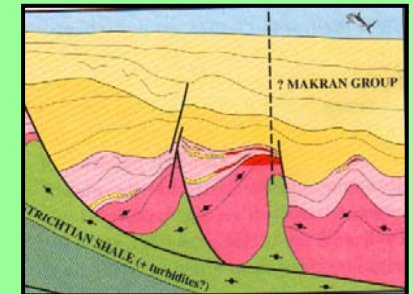
- and non-seismic methods
- positioning data fully integrated with geophysical data
- increase in use of GIS and RS

## The irregular earth:

- multiple approximations
    - optimised locally, regionally, or globally
  - ⇒ 500+ different **Reference Systems**
  - ⇒ impact: several hundreds metres 'fuzziness' of latitude, longitude
  - ⇒ 1500+ **map projections**
  - ⇒ 1500+ **transformations** between Reference Systems
- Managed in the Geodetic Registry

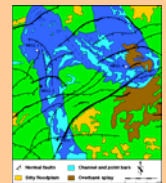
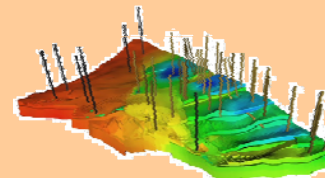
## Drilling

- main task of surveyor in hazard assessment preparing drilling site
- remote positioning

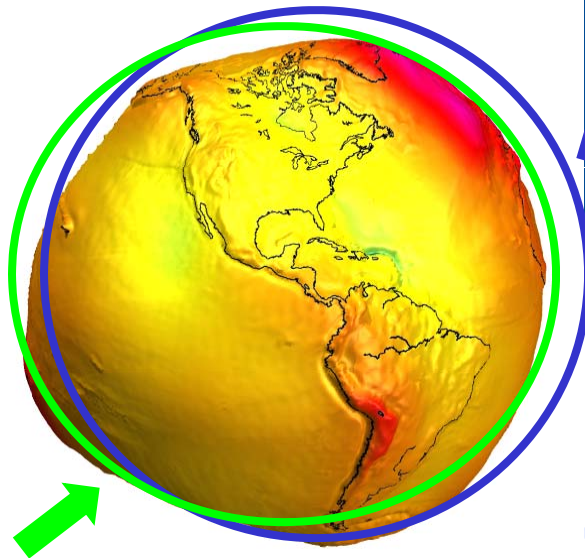


## Reservoir modeling

- growth area for spatial data management through realization of value spatial component; software becomes coordinate aware
- close co-operation with data management







## Construction

- deeper water – acoustic positioning
- colder areas – dealing with ice and cold
- Increasing co-operation with metocean and geo-technical

## HSE

- increasing use of geo sensors leading to requirement for data reduction, analysis and visualisation
- early identification of road hazards

## Well and Reservoir Management

- increasing use of geo-referenced data for understanding the reservoir
- optimising logistics in land based fields
- close co-operation with data management

## The irregular earth:

- multiple approximations
    - optimised locally, regionally, or globally
  - ⇒ 500+ different **Reference Systems**
  - ⇒ impact: several hundreds metres 'fuzziness' of latitude, longitude
  - ⇒ 1500+ **map projections**
  - ⇒ 1500+ **transformations** between Reference Systems
- Managed in the Geodetic Registry

## Education

- we need more trained surveyors (HND, Bsc, Msc) educated in wider area of geomatics incl. GIS
- We need more trained hydrographic surveyors (HND, Bsc, Msc)

## Meer geo studenten is essential

Niveau	Gevraagde uitstroom per jaar
HND	100 - 150 per jaar
Bsc	90 - 140 per jaar
Msc/Phd	60 - 100 per jaar

Uitstroombehoefte per opleidingsniveau (Bron: Stichting arbeidsmarkt geo)

Niveau	Aantal opleidingen	Uitstroom per jaar (gemiddeld laatste 3 jaar)
Msc/Phd	5	62 (waarvan 26 in Nederland blijven)
Bsc	1	16
HND	7	30

Daadwerkelijke uitstroom opleidingen (Bron: Stichting arbeidsmarkt geo)





# S&P Committee Charter



Surveying, positioning and coordinate management activities affect virtually all stages in the Exploration and Production lifecycle. Managing these issues correctly is important:

**Safety and the environment:** the safety of operational activities and the protection of the environment depends on the accuracy of surveying and positioning, and the reliability of coordinate data and mapping.

**The business:** with some 80% of upstream data involving spatial or geographical components, these are the foundation on which sound business analysis and decisions are made.

**Legal issues:** incorrect coordinate data may have implications for license agreements, relinquishments, unitisations and activities adjacent to concession and international boundaries.

# S&P Committee 'Silver Ware 2014'

OGP

1. EPSG Geodetic Parameter Dataset (EPSG database), the de-facto standard in the Oil & Gas Industry and beyond for geodetic parameters worldwide. **ISO accredited.**
2. Ten Guidance Notes published on OGP website (free download). **All up-to-date and also available through APSG, SEG, IMCA and CAPP websites**
3. Owner of **ten** Positioning Standards and **data models** . Published on OGP website (free download). **All up-to-date and also available through APSG, SEG, IMCA and CAPP websites**
4. Active Global Survey & Positioning Committee. **20 COC and 10 NOC**
5. Active Global Sub-Committees: **Geodesy, Geophysical, Well and Drilling, Construction and Inspection.**
6. Mechanism and energy for Joint Industry Projects: **EPSG database extension (AOI)**
7. Effective co-operation with SEG, APSG, **CAPP, Energistics** and IMCA

A stylized graphic of a globe, composed of several overlapping, light blue curved lines that form a hemispherical shape on the left side of the slide.

**Thank You**



# OGP Guidance Notes

OGP

Number	Title
<b>1</b>	<a href="#"><u>Geodetic awareness guidance note</u></a>
2	<a href="#"><u>Use of Bin Grids and Coordinate Reference Systems in Workstations</u></a>
<b>3</b>	<a href="#"><u>Contract Area Definition</u></a>
4	<a href="#"><u>Use of the International Terrestrial Reference Frame (I.T.R.F.) as Reference Geodetic System for Surveying and Real-time Positioning</u></a>
<b>5</b>	<a href="#"><u>Coordinate Reference System Definition</u></a>
7	<ul style="list-style-type: none"><li>• Part 1: <a href="#"><u>Use of the EPSG Geodetic Parameter Dataset</u></a> . This document includes annexes covering Data Naming Conventions and Rules for Deprecation and previously issued as Guidance Notes 9 and 12 (both of which have now been recalled) as well as some information previously included within the EPSG dataset README file.</li><li>• Part 2: <a href="#"><u>Coordinate Conversions and Transformations including Formulas</u></a></li></ul>
<b>10</b>	<a href="#"><u>Geodetic Transformations Offshore Norway</u></a>
13	<a href="#"><u>Advisory Note on Datum Transformation Evaluation and Use</u></a>
<b>14</b>	<a href="#"><u>Coordinates Reference Systems in Reserves Unitisation Agreements</u></a>
16	<a href="#"><u>Quality Control of Proposed Well Co-ordinates</u></a>

# Ex-UKOOA Digital Data Exchange Formats

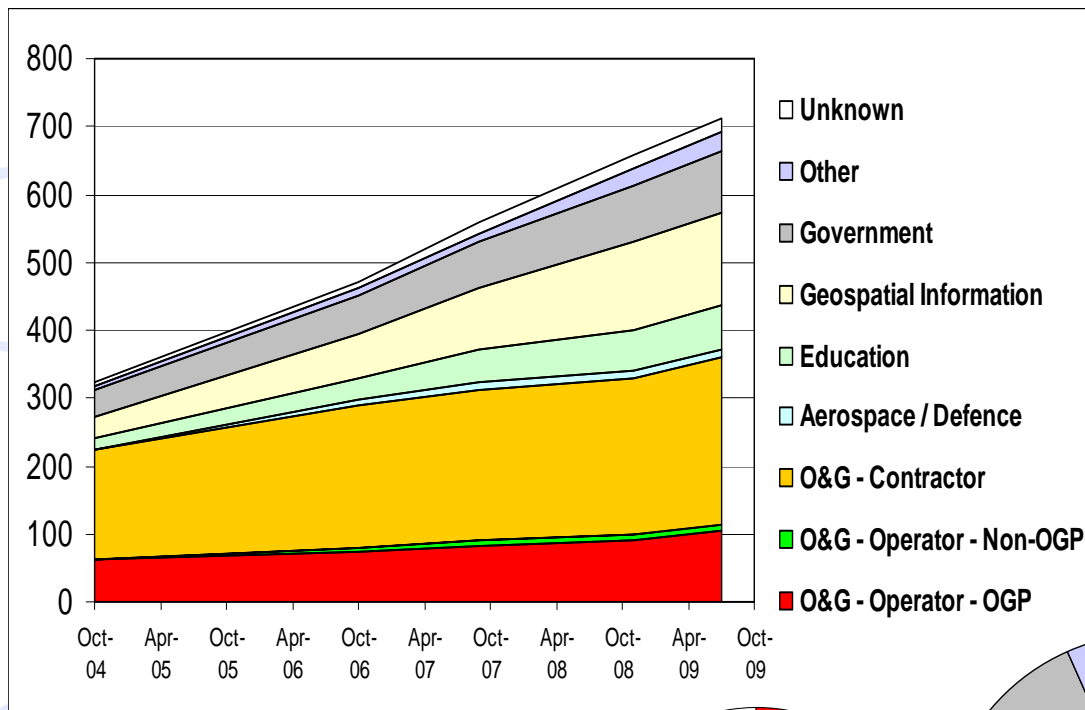
OGP

Number	Title
<a href="#">P1/90</a>	Data Exchange Format - Post Plot
<a href="#">P2/94</a>	Data Exchange Format - Raw Marine Positioning Data
<a href="#">P5/94</a>	Data Exchange Format - Pipeline Position Data
<a href="#">P6/98</a>	Data Exchange Format - 3D Seismic Binning Grids (revised in 2000)
<a href="#">P7/2000</a>	Data Exchange Format for Well Deviation Data
<a href="#">P-EPG</a>	EPG Coordinate Reference System Description in UKOOA P Formats

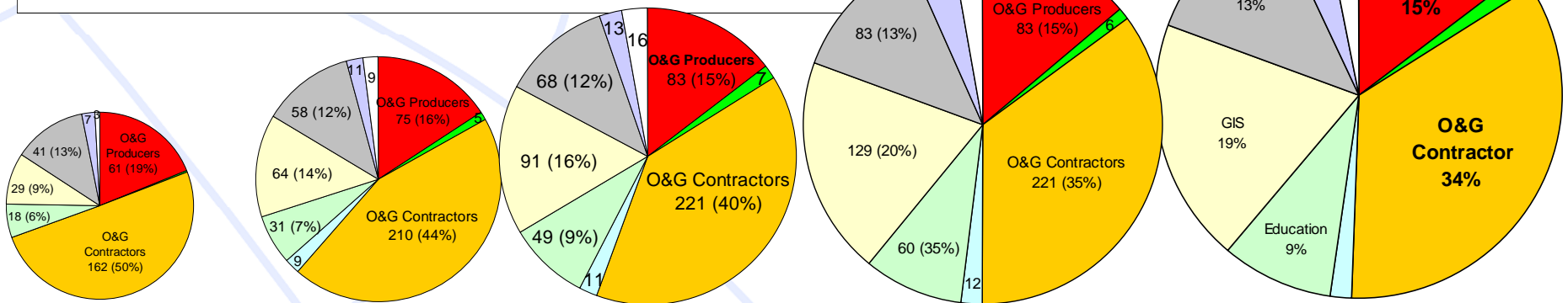
Number	Title
<a href="#">1065</a>	Guidance notes on the use of co-ordinate systems in data management on the UKCS
<a href="#">OPS13A</a>	Conduct of mobile drilling rig site surveys, volume 1, issue 1.2
<a href="#">OPS13B</a>	Conduct of mobile drilling rig site surveys, volume 2, issue 1
<a href="#">OPS13C</a>	Conduct of mobile drilling rig site investigations in deep water, Version 1
<a href="#">DGPS</a>	UKOOA guideline: The use of <u>dgps</u> in Offshore Surveying - September 1994

# EPSG Geodetic Parameter Dataset

# OGP



- Continues to be world leader.
- Users doubling every 5 years.
- 50% users related to E&P indirectly (government, etc).





- Previously distributed as an MS Access database now through [www.ogp.org.uk](http://www.ogp.org.uk).
- Web enablement through JIP 23 (€195k), started 2005 and closed out April 2009.
  - some software bugs still to be fixed.
  - to increase efficiency of data maintenance, some software enhancements required – cost \$20k from 2009 budget.
- Future plans for dataset:
  - work towards obtaining ISO accreditation by end 2010.
  - add map front end – new JIP 2010-2011.
  - promotion of dataset to application developers/vendors to imbed dataset directly into their applications.

# Geodetic Registry Web Enabled Software JIP 23

OGP

**Start:** 2006

**Completion:** 2009

**Number of Participants:** 16    **Total Budget :** €195k

**Business Issue:** Users insist on web-enablement, otherwise usage will drop and status of de-facto industry standard will be lost.

**Objective:** Modernise delivery of EPSG dataset by developing querying, reporting and data maintenance capability over the Web, as well as direct data access through software.

**How:** Functional specifications were created by Geodesy sub-committee and a contract was set-up with Galdos Systems Inc. to create the EPSG registry based on their geodetic software engine.

**Implementation:** Web enabled geodetic registry is now operational on OGP web server ([www.geodetic-registry.org](http://www.geodetic-registry.org)) and users are doubling every 5 years.

# Geodetic Integrity of Geoscience Software (GIGS) JIP 24



**Start:** 2007\*

**Completion:** 2010

**Number of Participants:** 12

**Total Budget :** \$1,436,700

**Business Issue:** Geodetic/ geospatial integrity failures in software

**Objective:** Provide Geoscience software vendors with tools to self-verify software for geodetic integrity

**How:** The JIP will create a global test dataset and a self-verification process. The global test data set is ready to be published and the self verification process is created by testing various software applications from different vendors by the JIP.

**Implementation:** O&G operators and contractors to insist that vendors verify their software.



# S&P Links to other organisations



**ISO TC211** (Geographic Information, Geomatics), OGP S&P are heavily involved in efforts to create an ISO geodetic register

- **Society of Exploration Geophysicists (SEG)\***
- **Americas Petroleum Survey Group (APSG)\***
- **International Marine Contractor Association (IMCA)\***
- **Canadian Association of Petroleum Producers (CAPP)**

*\* representatives of these organisations are present at our S&P meetings.*