Ingenio and Paz Ground Segments

INDRA SISTEMAS S.A.

June, 2012

Indra – WHO WE ARE

The premier IT company in Spain and a leading IT multinational in Europe and Latam

- Revenues: €2,688M
- 36,000 professionals
- 110 countries

Own solutions and technology

- Differential business model based on Innovation
- R+D+i: 7%-8% revenues
- Among the 3 largest European IT services companies by market cap
# AND COMPLETE OFFER

<table>
<thead>
<tr>
<th>Offering</th>
<th>Markets</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Solutions</strong></td>
<td>Transport &amp; Traffic</td>
</tr>
<tr>
<td>73%</td>
<td>22%</td>
</tr>
<tr>
<td>Consulting</td>
<td>Security &amp; Defence</td>
</tr>
<tr>
<td>Technology solutions</td>
<td>23%</td>
</tr>
<tr>
<td><strong>Services</strong></td>
<td>Energy &amp; Industry</td>
</tr>
<tr>
<td>27%</td>
<td>14%</td>
</tr>
<tr>
<td>IT Outsourcing</td>
<td>Public Administration &amp; Healthcare</td>
</tr>
<tr>
<td>BPO</td>
<td>14%</td>
</tr>
</tbody>
</table>

- **Think & Build**
- **Operate**

---

# EARTH OBSERVATION DIRECTORATE

- **Military Communications and Space**

1. **20 years experience in satellite ground segment**
   - Helios I & II
   - Pleiades
   - SMOS
   - MUSIS
   - Ingenio & Paz
   - EPS/Svalbard

2. **High level data processing and exploitation systems**
   - High level product generation systems
   - Spatial Data Infrastructures
   - Defence imagery exploitation systems
   - SAR data exploit. systems
   - Urban exploitation systems

3. **Remote Sensing applications and services**
   - GMES
   - Advanced product development
   - MGCP
   - High volume cartographic production
   - Certified developer for ERDAS, ESRI, Intergraph
   - Training and Consultancy
**BACKGROUND – PNOTS PROGRAMME**

**Overall view**

- PNOTS = “Programa Nacional de Observación de la Tierra por Satélite”
- Collaboration agreement between Ministries of Industry and Defence
- Two satellites: SEOSAT/Ingenio (optical) and SEOSAR/Paz (radar).
  - Paz: dual mission with imagery quota reserved for MoD. Ownership: Hisdesat (PPP MoD)
  - Ingenio: institutional & commercial usage. Ownership: Ministry of Industry
- Both satellites are GMES contributing missions

---

**SEOSAT/INGENIO AND SEOSAR/PAZ**

**Overall view**

<table>
<thead>
<tr>
<th>INGENIO</th>
<th>PAZ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Optical system</td>
<td>Dual SAR System (Civilian / Defense)</td>
</tr>
<tr>
<td>Operative in 2015</td>
<td>Operative in 2013</td>
</tr>
<tr>
<td>1 band PAN plus 4 bands MS (RGB, NIR)</td>
<td>Acquisition modes</td>
</tr>
<tr>
<td>60 x 60 km images</td>
<td>- Spotlight (10 X 5 km @ 1m)</td>
</tr>
<tr>
<td>Resolution PAN: 2.5 m; MS: 10m</td>
<td>- Scansar (100 km @ 15m)</td>
</tr>
<tr>
<td>Up to 500 images per day</td>
<td>- Stripmap (30 km @ 3m)</td>
</tr>
<tr>
<td>More than 200 images per day</td>
<td></td>
</tr>
</tbody>
</table>

- Indra is Prime contractor of Ingenio GS and leads the development & delivery of Paz GS
- Main contracts from INTA (Paz) and ESA (Ingenio)
- Grouping the Spanish GS industry to enable the maximum commonality
GROUND SEGMENTS COMMONALITIES

Both ground segments are co-located at INTA’s facilities in Torrejón de Ardoz (Madrid)
- Shared TTC and image telemetry reception infrastructure
- Other commonalities in their design and construction
- Operation: INTA / Hisdesat

PAZ

A dual design (Defence / Civilian usage)
- A daily imagery quota reserved for MoD. The rest for commercial usage
- Including military grade security in the Defence side
- Three centres:
  - Torrejón de Ardoz (INTA)
  - Torrejón de Ardoz (Military Base)
  - Maspalomas
- Project stakeholders: INTA (GS owner, infrastructure provider and contracting authority of the GS), Hisdesat (satellite owner), MoD (user), EADS CASA (satellite constructor)
- Schedule of the GS:
  - Subsystems CDRs on going
  - CDR end of the year
A commercial mission

Three centres:
- Torrejón de Ardoz (INTA)
- Maspalomas
- Polar station

Project stakeholders: ESA (contracting and technical authority), CDTI (funding agency), INTA (infrastructure provider)

Schedule GS:
- GS SRR held in May
- Phase C/D/E will be initiated at the end of the year
- Launch foreseen in 2015
INTEROPERABILITY

Ground Segment

- Ingenio
  - GMES interface included in the requirements
  - HMA catalogue interface (CSW)
  - HMA ordering interface (SPS)

- Paz
  - No direct HMA interface but standards have been used
    - CSW in archive subsystem
    - SPS in user services
    - Interface with Commercial Services uses CSW

Daniel Carrasco
Victoriano Moreno
Emilio Viedma

Earth Observation Directorate

dcarrasco@indra.es
ymoreno@indra.es
ejviedma@indra.es

www.indra.es