Indra Systems, Inc.
Orlando, FL

- A US subsidiary of Indra Sistemas, Madrid, Spain
Simulation & Automatic Test Systems

- **Simulation**
  - Military
  - Civil
  - Flight
  - Ground
  - Railway
  - Port Machinery

- **Automatic Test Systems**
  - Automatic Test Equipment
  - Test Program Sets
    - CASS/RTCASS
  - Test Bench Software
  - Second & Third Level Maintenance
  - Engineering Support
Military Simulation

Ground Vehicles

Aviation
Civil Simulation

- Motor Grader Simulators
- Dump Truck Simulators
- Railway Simulators
- Port Cranes and Machinery Simulators
Pervasive Crane Training Needs

• Multiple cranes may be in use
• The total team needs training
  • Crane Operators
  • Riggers
  • Basket Personnel
• Port Cargo handling accidents can be:
  • Very expensive
  • Bad for your health
• OJT training can’t adequately simulate accidents and emergency situations
• Individual aptitude and experience varies greatly
Civil to Military Considerations

- Crane Operation Incident Causes
  - Equipment Failure = 50% (Root causes suspect)
  - Human Error = 35%
  - Weather = 15%
- Higher military personnel turnover rates
- All weather Operations can be essential
- Product and component obsolesce and life cycle support issues are common
- Financial models vary greatly
- Design goals – modular and reconfigurable
- Design standards and ILS considerations may vary considerably

1. US Dept of Interior Study; 2001
System Description

- Full Mission Simulator
- Planning Station
- Brief/Debrief System
Full Mission Simulator

• TRAINEE STATION
• RT I/O INTERFACE
• HOST COMPUTER
• MOTION PLATFORM
• SIMULATION MODELS
• VISUAL SYSTEM
• AUDIO AND COMMUNICATIONS
• INSTRUCTOR WORKSTATION
Trainee Station
Trainee Station

Reconfigurable

Interchangeable models for Gantry and Port Crane simulations
Visual System

- Open Architecture with COTS
- Easily expandable
Visual Data Base

**Modular & Flexible Database**

- Port crane
- Gantry crane
- Vehicles (several models)
- Vessels (several models)
- Spreaders width (20 to 45 ft)
- Towing hooks (several models)
- Containers (20 to 45 ft)
- Pallets with varied sizes and materials
Motion Platform

- 6 Degrees of Freedom
- Surge and Sway excursions better than 260mm
- Heave excursion better than 200mm
- Roll, Pitch and Yaw better than 18°
- Electrically Driven
Potential DoD Business Issues

- Ownership of the design and documentation
- The sometimes unpredictability of DoD’s ability to fund projects
- Questionable ability to up-front commit to fund long term turnkey operations ala airline training centers
- Is there a payback \(^2\)
  - 65 – 95% reduction in accidents
  - 25-50% reduction in OJT hours
  - 50% increase in efficiency

2. IADC Training Committee; 9/2001
Creating a viable financial model is essential.

Must maximize the served market:

- DoD Command sponsors: Training & Port Centers
- Commercial users
Create a South East US turnkey training center dedicated to Port type operations in Orlando

Equip with a modular and reconfigurable simulation center, and training curricula, to meet a wide range of requirements

Private and/or public capitalization (Barcelona Model)

Multi-year training contracts are essential
Modular & Expandable Solution

- Simulation Models
- Visual Data Base
- Application Visual SW
- Audio Library
- Instructor Position Pages
- Handles Consoles

Generic Cabin