



Indra

Commercial Training Applications, Some Practical Considerations

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Indra: Simulation & Test Systems

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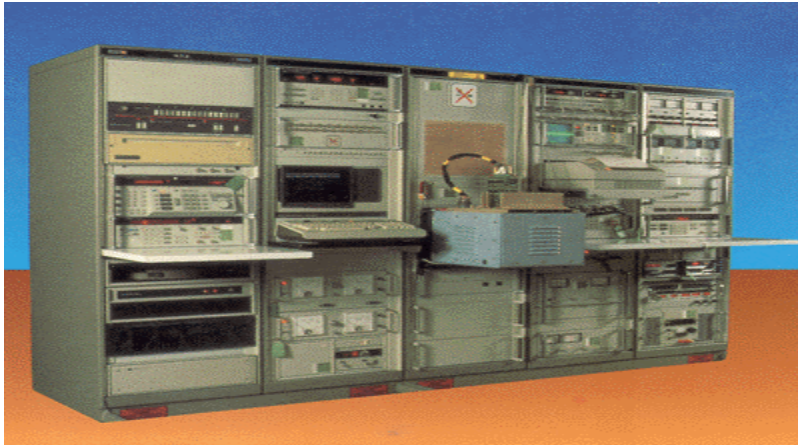
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Indra Systems, Inc.
Orlando, FL

- 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

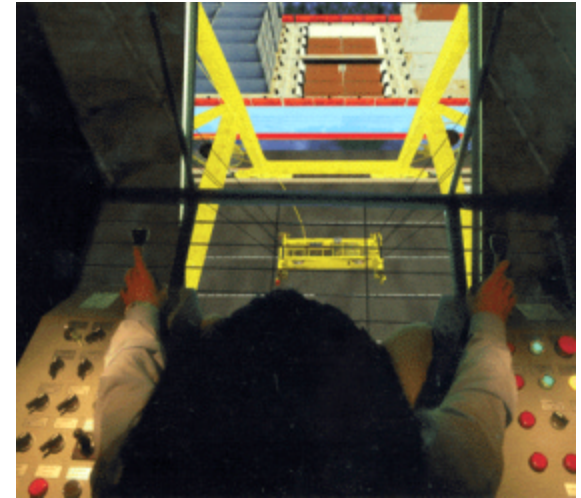
Aviation

Ground Vehicles



Civil Simulation

- **Motor Grader Simulators**
- **Dump Truck Simulators**
- **Railway Simulators**
- **Port Cranes and Machinery Simulators**





CRANE 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 ¹**
 - **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**

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

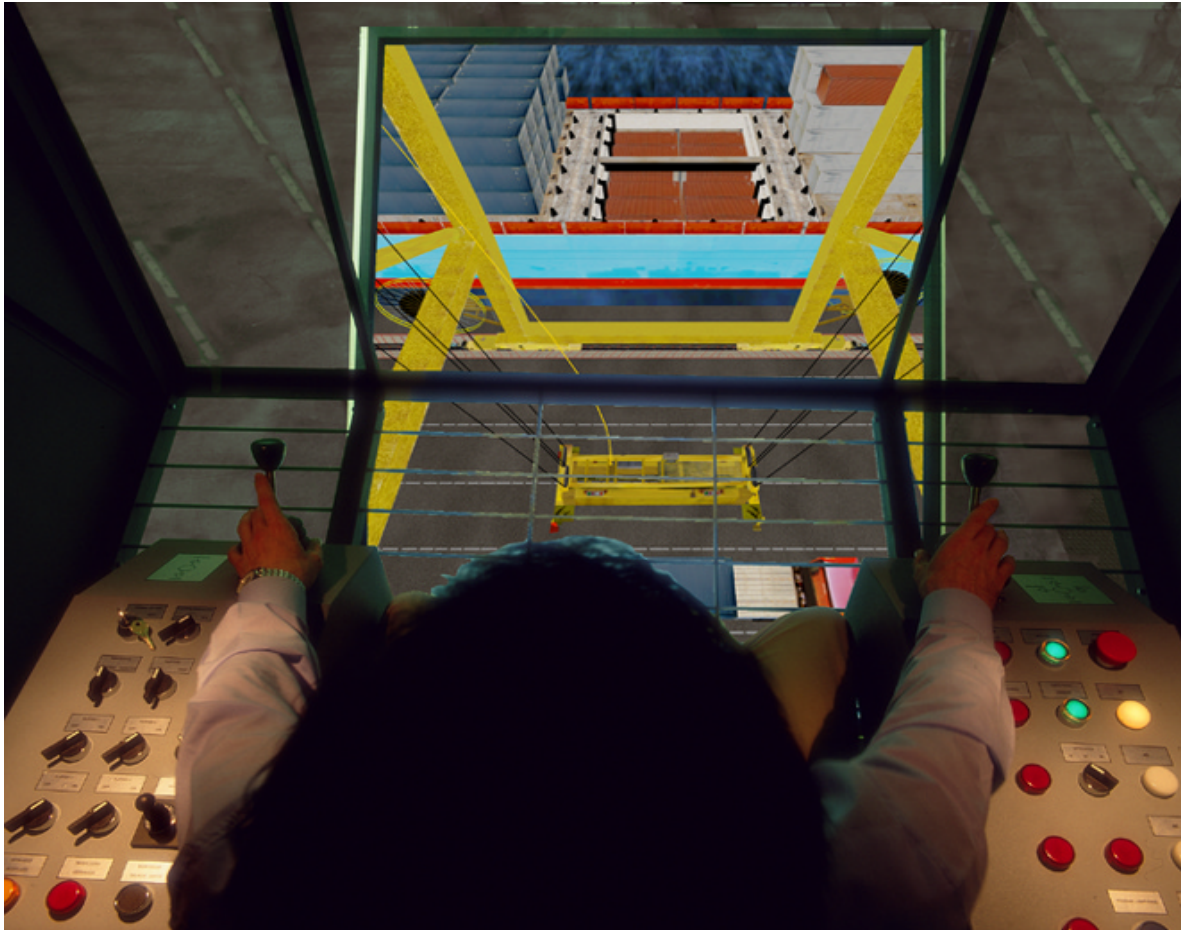


Trainee Station



Visual System

- Open Architecture with COTS
- Easily expandable



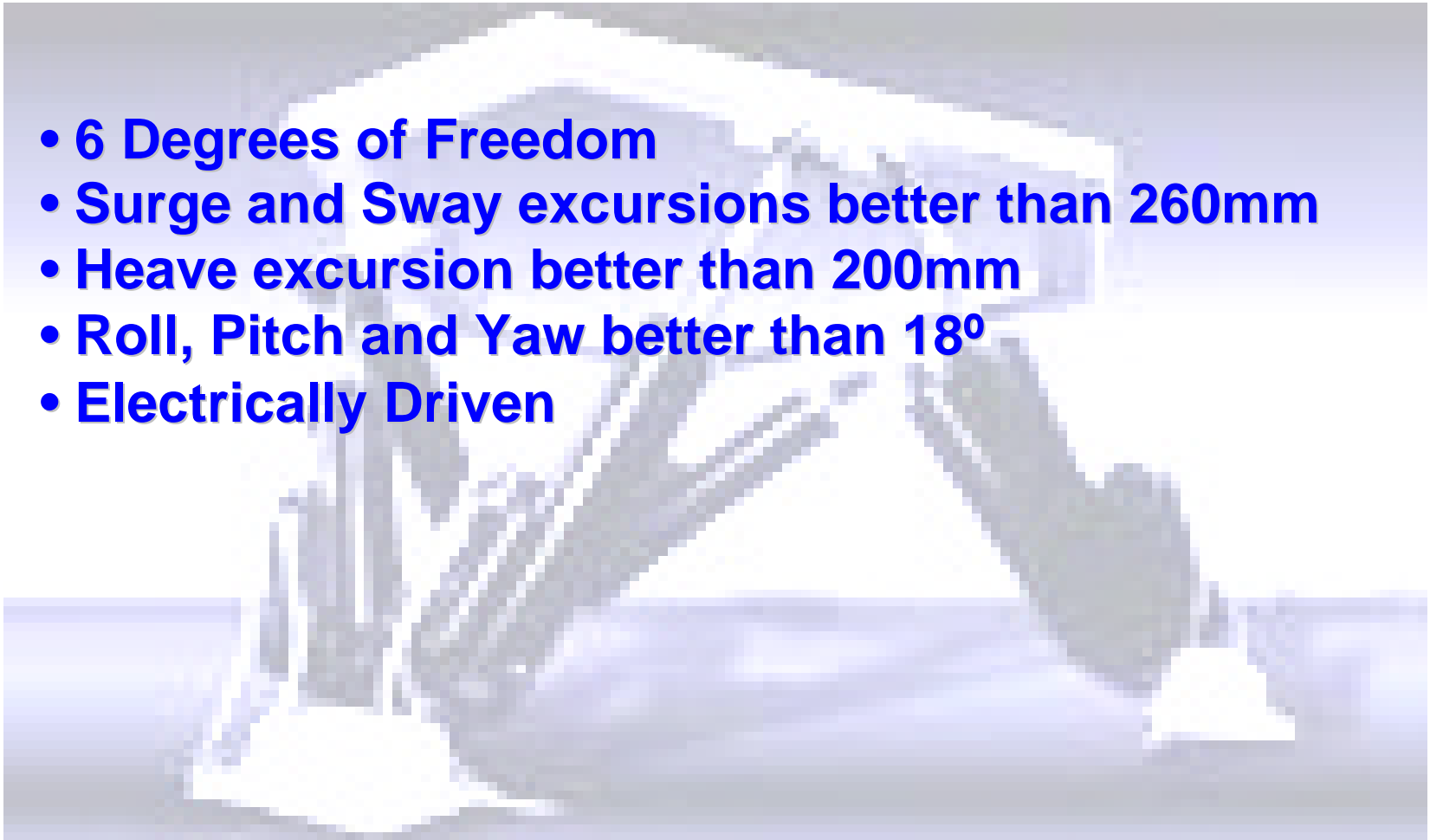
Visual Data Base

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**

DoD Application Concept

Assumptions:

- **Creating a viable financial model is essential**
- **Must maximize the served market:**
 - **DoD Command sponsors: Training & Port Centers**
 - **Commercial users**

DoD Application Concept

Concept:

- **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

