Developments in Tsunami Measurement and Monitoring

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PMEL-Lab Review
August 2008
DART® system evolution

1) 20 yrs+ of tsunami research (early 80’s)

2) Internally recording instruments (mid-80’s)

3) One-direction realtime reporting (DART® I) (mid-90’s)
   Transitioned to NOAA operations

4) Bi-directional, global reporting (DART® II) (2003)
   Patentend & transitioned to NOAA operations
   Concept copied/adopted by commercial vendors (2006)

5) Bi-directional, global, easy to deploy R&D (DART®-ETD) (2007)
   • SAIC licenses DART II technology
   • Systems deployed with Indonesian and Australian R&D partners (2008)
   • 45 systems installed, adoption in 5 countries
International Leadership

- DART system description publicly available after Sumatra tsunami
- Concept copied and adopted by 4 commercial firms and 3 national efforts
- Founding member of IOC-International Tsunameter partnership (standards, tech transfer, etc)
- MOUs and tech transfer agreements:
  - NOAA-NDBC
  - Australia (Bureau of Meteorology)
  - Indonesia (BPPT)
  - Chile (SHOA)
Commercial DART® Licensee

- Application/selection process
- Non-exclusive, royalty generating
- Sales 2007-2008 ~$2.7M
- On going partnership
Recognition

- Patent & Patent (Pending)
- Dept of Commerce Gold Medals (2ea)
- Dept of Commerce Bronze Medal
- NOAA Tech Transfer Award
Key PMEL Technology Developments 2004-2008

- Novel ‘self-deploy’ mooring design for manufacture and safe, efficient operations
- Continuous Composite Mooring (patented w/ partners)
- Vandal Resistant, flexible design
- Expendable 4-year BPR
- Robust acoustic modem integration and protocols
DART®-ETD

Features:

• ~4 year expendable BPR
• Conex packaging
• MET sensors
• “Factory-built”
• Transferable technology
Field Deployments

Present Locations:
North Pacific, Southern Ocean,
Hawaii, Bali

Duration: 3 months -1.5 years

Data Availability:
>95% in all locations

Ongoing evaluations per NOAA operations and international standards
Future Focus

- Transformational Energy Savings
  - Large efficiency gains actually cost less
  - End use/least cost

- Reduce size and cost (System→Sensor)

- Continued Mooring Line improvements
  - Inductive Communication to Seafloor
Small Posters for Demo Area

PMEL line testing & design innovations

• Bite resistant lines
• Conductor to seafloor
• Modeling advancements
Animation of deployments & testing

- Dockside at PMEL
- At sea (Hawaii or Bali)