

Tsunameter Equipment Standards

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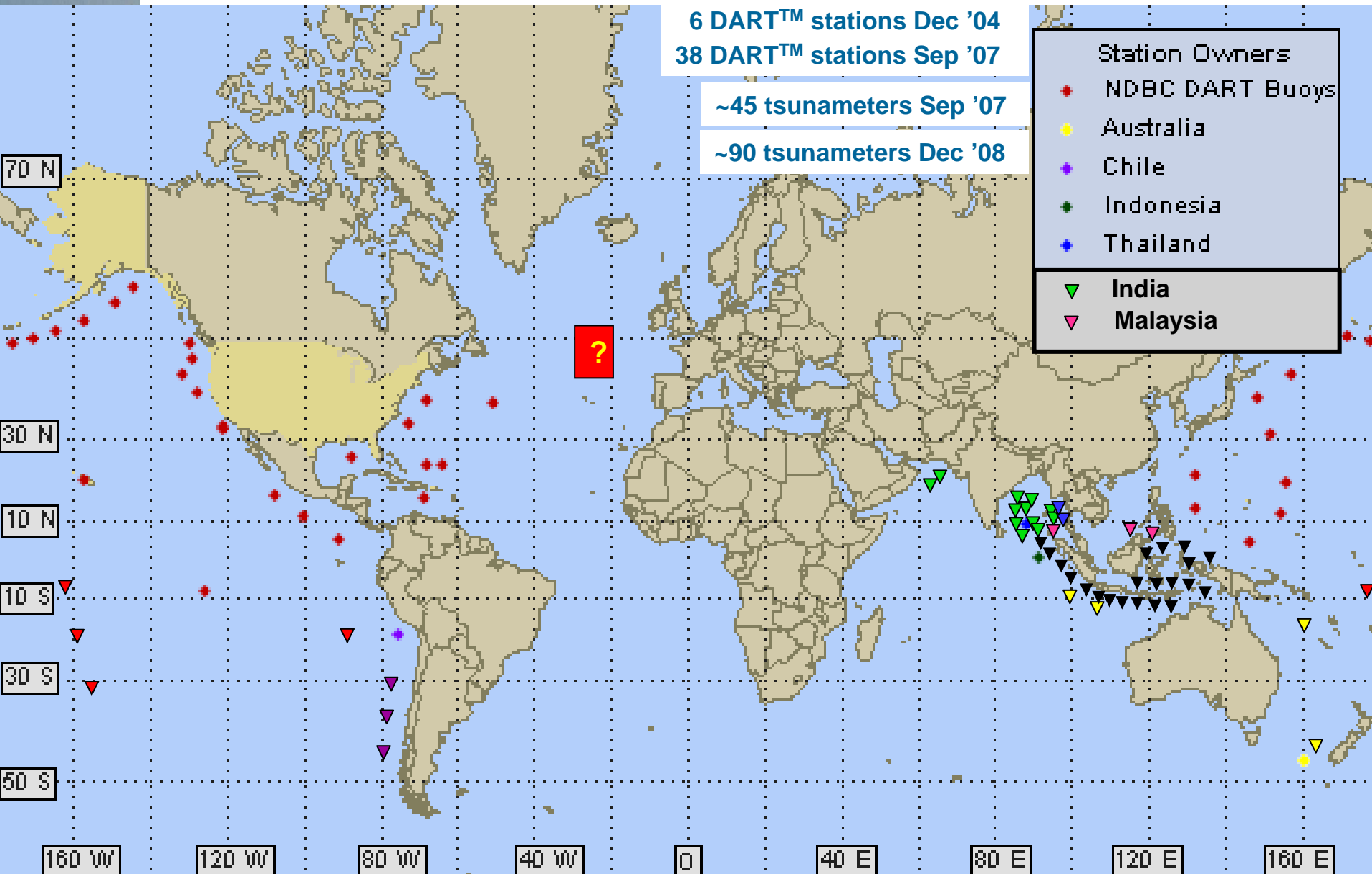
Getting to a Standard

- Motivation for a Standard
- Stakeholders and Participants – an evolving mix
- What does Tsunameter Have to Do?
- What's In the "Standard" ?
- Outcomes to Date – Ins and Outs, and Too-Hard-at-This-Stage
- Where's It Going? The Next Steps
- DBCP Experience Injection?

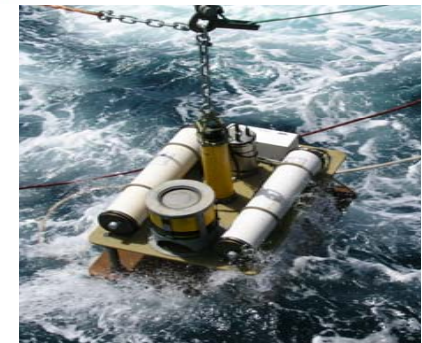
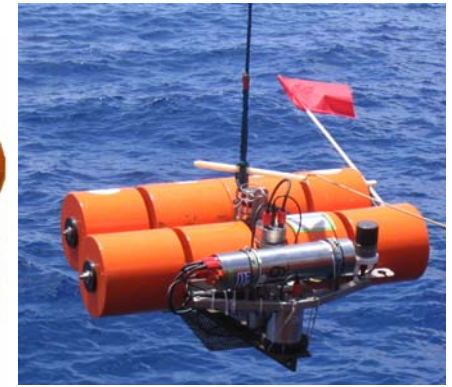
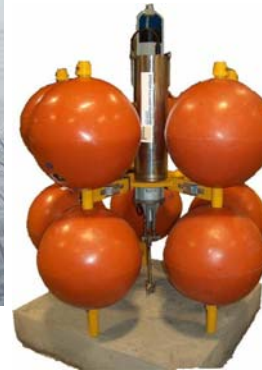
Background

- ❑ Dramatic need to increase global tsunami warning systems capability after Dec '04 Indian Ocean tsunami.
- ❑ One deep ocean tsunami detection product (DART™) existed at Dec '04 - not available to others (or the US) in quantity, or in time to meet demand.
- ❑ Four new suppliers emerged with DART-derivative products in 2005-06. Contracted commercial supplier to meet US need for ~ 39 DARTs. “Indigenised” variants also being developed.
- ❑ No agreed instrument standards existed, only published DART “specs” and technical descriptions.
- ❑ Warning centres need to purchase products with confidence to meet their needs, and to be able to trust their neighbours’ systems data and the warnings that may be derived from them.
- ❑ Technology not straightforward, or inexpensive. Inter-comparisons are problematic. Some teething troubles with newly emerged products.
- ❑ International Tsunameter Partnership established under IOC/IOTWS to develop standards, to promote exchange and collaboration between operators, developers and suppliers of tsunameter products.

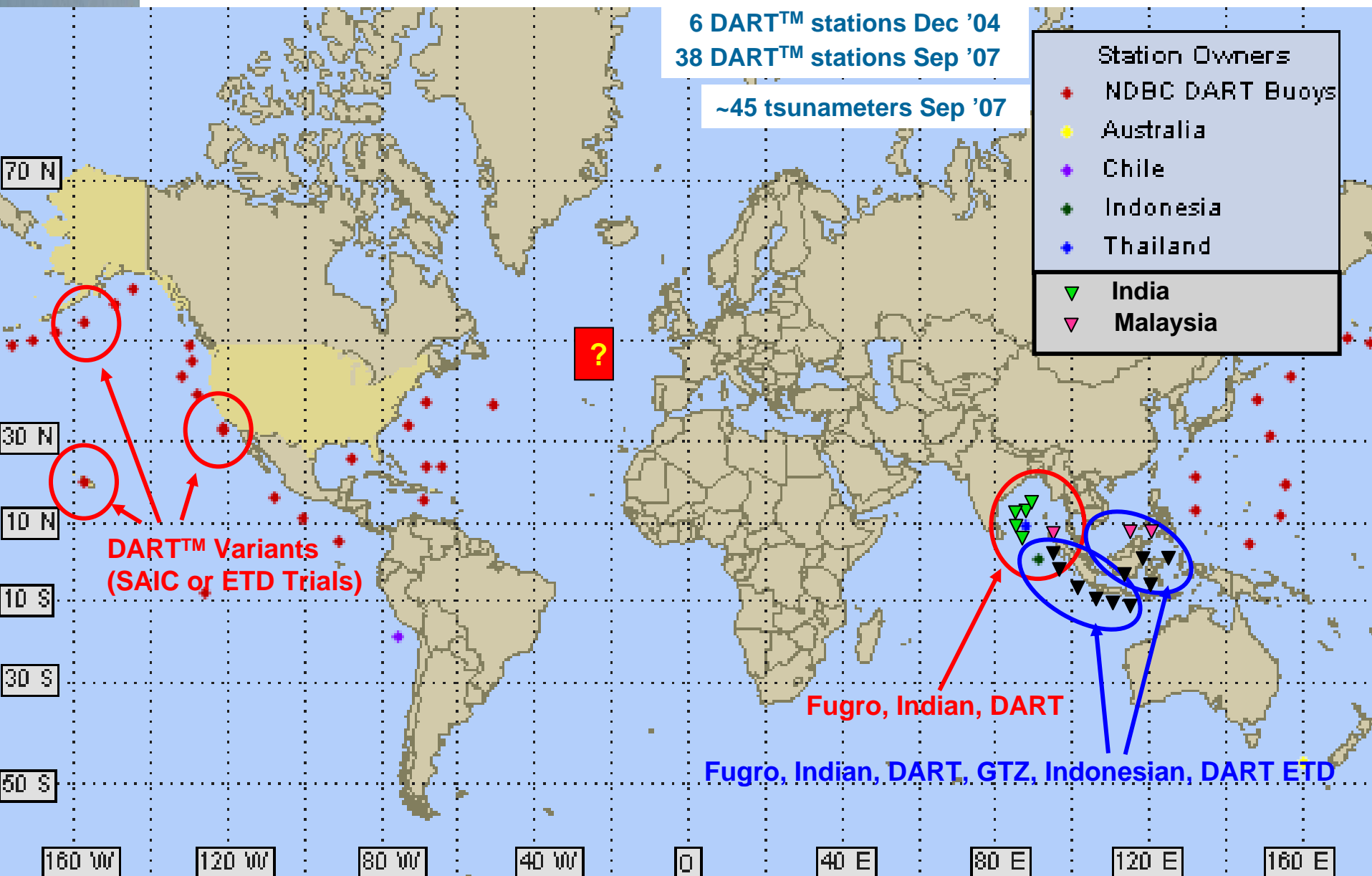
Global Tsunameter Population (+Plans)



Tsunami Equipment Variants (some) Excluding Cabled Instruments

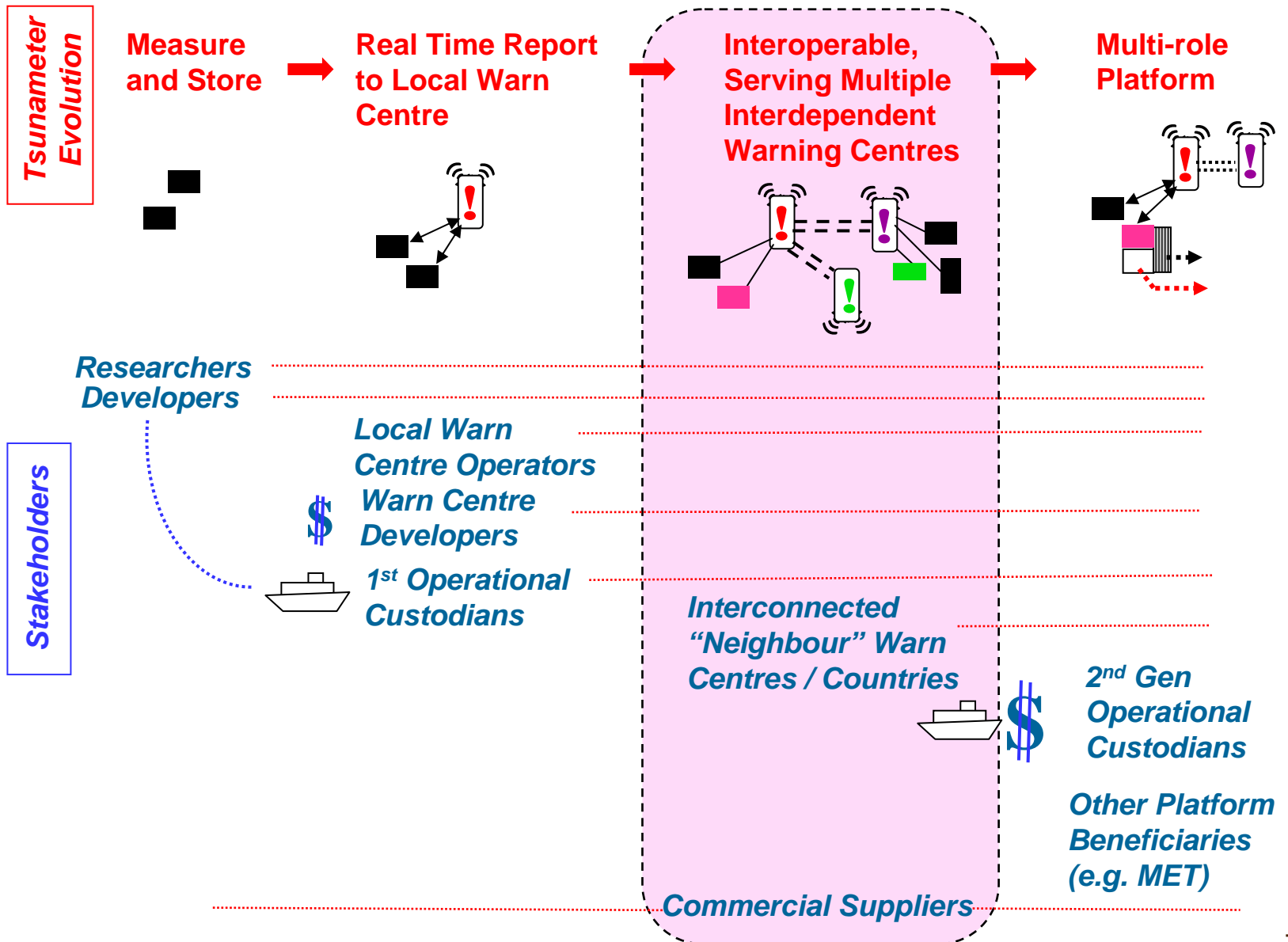


Locales in 07 with Dissimilar “Neighbours”



Stakeholders:

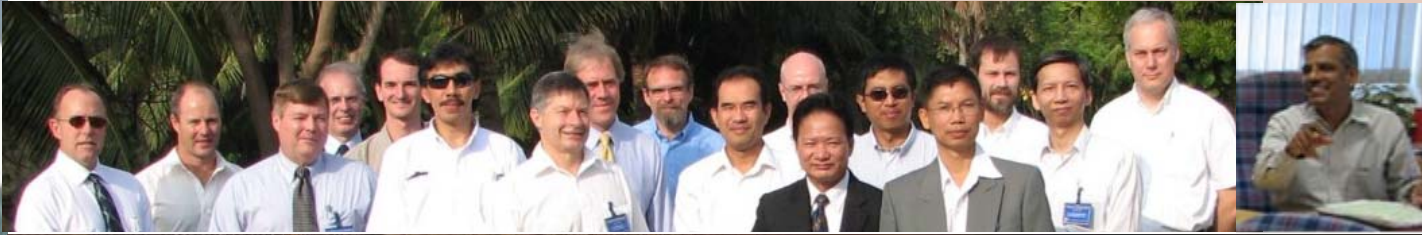
You Are Defined by Your Relationships



Some Process Hurdles

- ❑ **De-facto reference (DART™) is an evolved product, not a user requirement.** Needed to reference the needs of a modern warning centre, or other stakeholders.
- ❑ **Primary end users (warning centres) are themselves new to the task** – generally not yet demanding or mature in thinking about warning process needs. Researchers better informed about science, but can be removed from warning centre “hot seat” role.
- ❑ Warning centres and operational custodians may have **distinct local priorities.**
- ❑ **New product suppliers** generally competent in related technical / engineering issues, but have designed to match or better a successful product rather than re-conceptualising tsunami detection and warning processes.
- ❑ **“Shall” clauses exclude.** Sensitivity to being rejected. “Guidance” or “best-practice” clauses can point the way without dismissing 1st generation products.
- ❑ **Trust and open-ness required** between suppliers and purchasers, and between suppliers and other suppliers, to disclose approaches, negotiate limits.
- ❑ Some important **attributes** – **eg data delivery success, not well characterised** across product types, and practical deployment locales.
- ❑ Realistic testing and **product acceptance / inter-comparison is tough & \$\$!**
- ❑ **Tsunameter product evolution** has a way to go – requirements will change.

The Tsunameter Partnership Team



*ITP-1
Chennai
Feb 07*



*ITP-2
Jakarta
Sep 07*

India

Thailand

Malaysia

Indonesia

Australia

USA

Taiwan

Germany

Korea

IOC/UNESCO

SUPPLIERS / DEVELOPERS

NOAA-PMEL (USA)

GFZ (Germany)

Fugro Oceanor (Norway)

Sonardyne (UK)

Envirtech (Italy)

SAIC (USA)

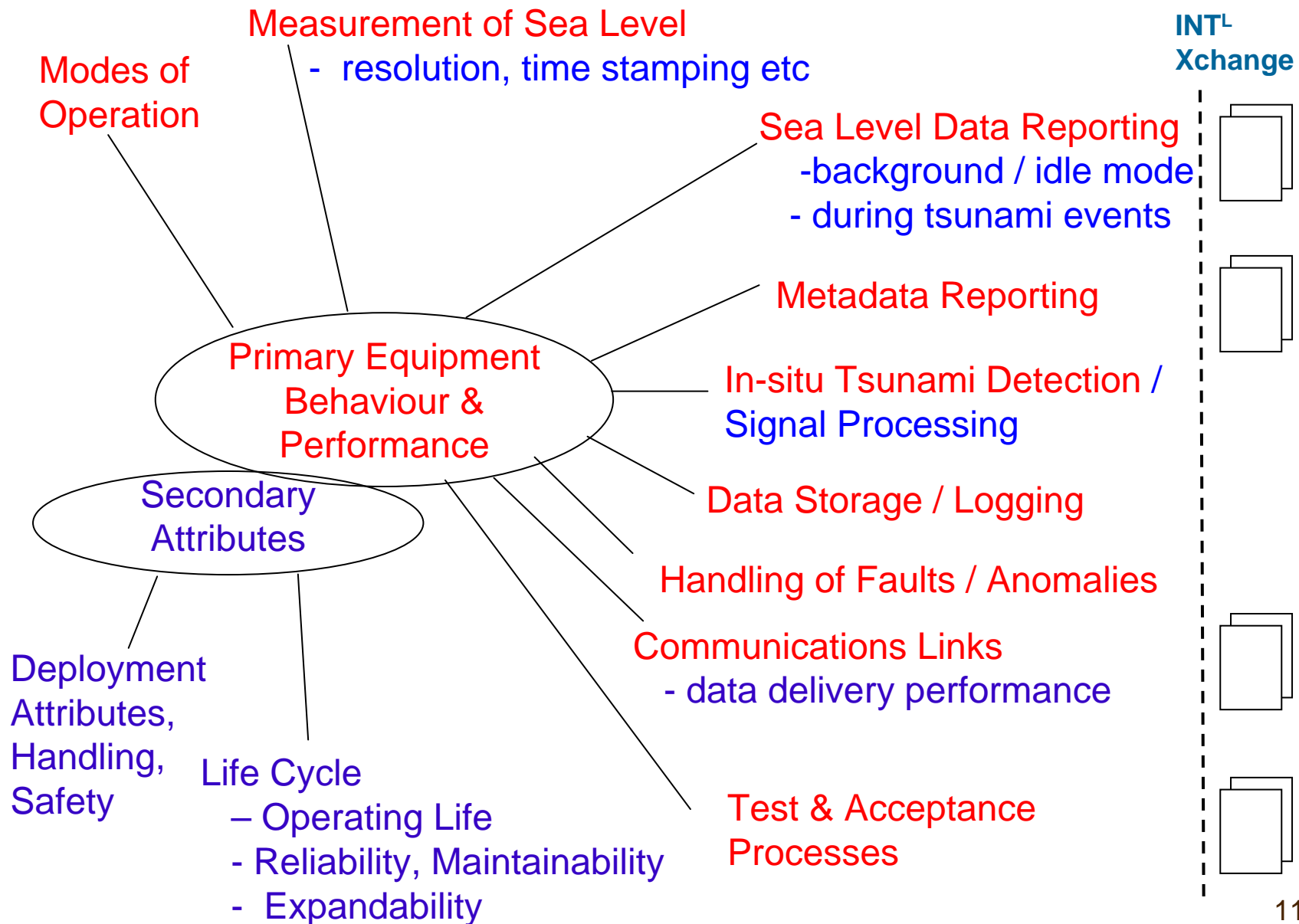
Lighthouse R&D (USA)

SeaBird Electronics (USA)

What are Expectations of a Tsunameter?

- ❑ Researchers and Modellers – very good high resolution data, lots of it, recoverable from any event, not necessarily in real time; metadata also available
- ❑ Warning Centre Developers – cost effective, esp. purchase costs, suited to preferred deployment sites, reliable, adequate data quality and real-time delivery, easy integration into warning centre
- ❑ Local Warning Centre Operators – trustworthy easy-to-interpret real-time data of sufficient quality to make warning decisions; reliable, timely data delivery; operational control when it matters;
- ❑ Neighbour Warn Centres – “behaves the same as mine” – meets my warning performance standards, or understandably different, easy to ingest / interpret, easy to check state of health
- ❑ 1st Gen Observation Network Custodians / Sustainers? – works out of the box, supports my service level standard for equipment availability; requires infrequent attention; no complexity in deployment vessels or crew that isn’t easy to access; easy to detect and diagnose if troubles arise
- ❑ Suppliers – fits my product; easy to achieve target performance with normal production/ test/ supplier tolerances
- ❑ 2nd Gen Network Custodians / Sustainers (next gen purchasers?) - trouble free, lowest possible ownership life cycle costs, multiple dependable supply sources?
- ❑ Technology Developers -
- ❑ Other Platform Beneficiaries – mission-flexible, expandable sensor suite, competent communications etc to handle my current and future requirements and wishes.

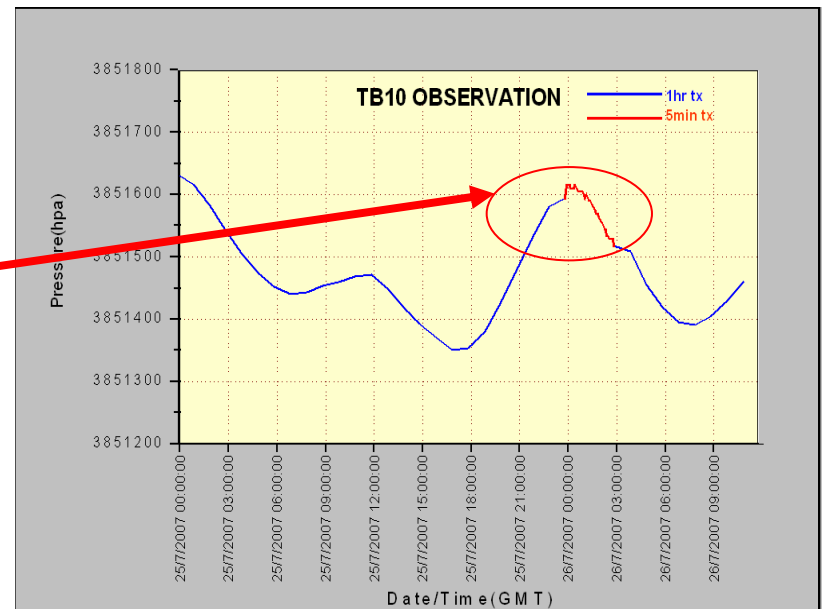
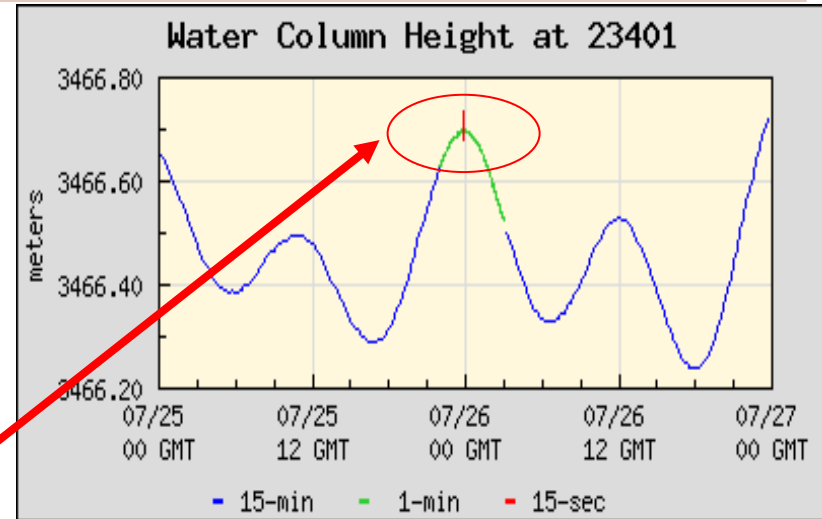
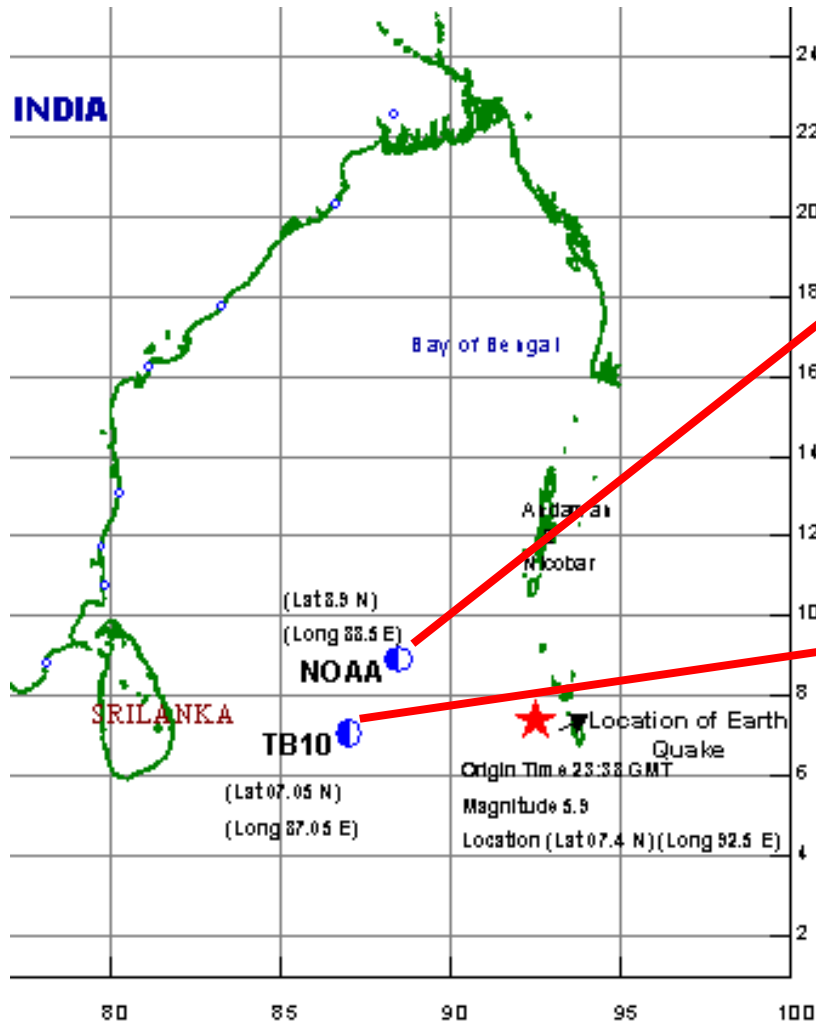
What's In a "Standard" ? (in an evolving product)



What's Next?

- ❑ Equipment Performance Standard & Guidelines: Iss 1 - released
- ❑ Developing International Data Exchange Formats – GTS, other
- ❑ Developing Metadata Schema and access methods
- ❑ Will benchmark performance of neighbour stations
- ❑ Standard will evolve – converge on matters that have been treated differently by suppliers – esp event mode reporting and data storage
- ❑ Quality processes and life cycle characteristics to be developed
- ❑ Test and Acceptance protocols being shared – best practice examples
- ❑ New mission profiles? – other sensors,

25 July '07 Earthquake – Indian and US Tsunameter Records



A Question

DBCP Engagement and Experience Injection?

