

Reference exhibit

The Introduction of Ocean Technology and Capability

The Introduction of OBS System

Ocean Bottom Seismometer (OBS) System

Features

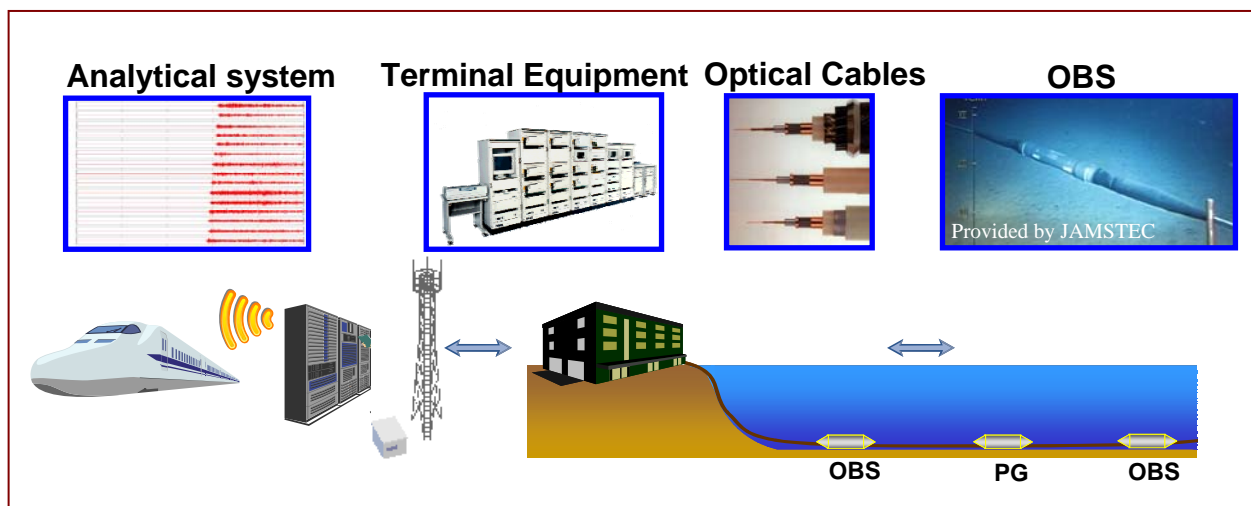
1) Real-time Observation from the Vicinity of Seismic Active Zone in the Ocean

2) Supply High Reliable System by Applying Submarine Telecommunication Technology

Overview

NEC has the capability to supply highly reliable OBS Systems on a Full-Turn Key basis, such as development, manufacturing and installation.

The OBS system is mainly consist of Ocean Bottom Seismometer (OBS), Pressure Gauge (PG), Optical Cables, Terminal Equipment and Analytical System.



<Outline of OBS specification>



- Length : 1630mm
- Diameter : 265mm
- Weight : 350kg in air
- Velocity Type : 1 μ kine to 1 kine
- Acceleration Type : 1 mgal to 1G
- A/D Converter : 24 Bit 1 kHz
- Pressure Tight Housing : 8,000 m Water Depth

Advantages

1) Real-time Observation from the Vicinity of Seismic Active Zone in the Ocean

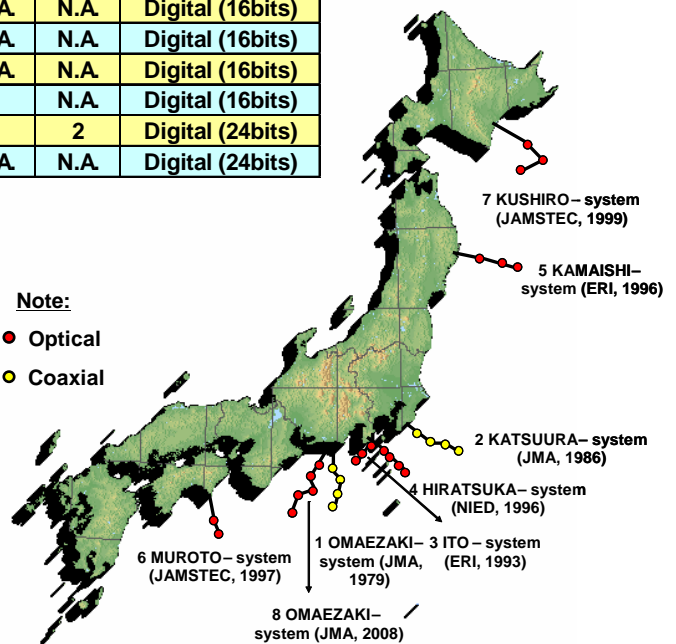
- Early detection of seismic pre-phenomena
- Precise determination of earthquake occurrence location
- Real time data transmission to Earthquake Early Warning System

2) Supply Highly Reliable System by Applying Submarine Telecommunication Technology:

- Continuous Earthquake Monitoring and Data Logging with long-term stability
- Contributing to Analyze Earthquake Occurrence Mechanism and Disaster Prevention

Application Examples

No	Location	Owner	Installation	Length (km)	Equipment				Dynamic range
					OBS	PG	DSO	B-MUX	
1	Omaezaki	JMA	1979	120	4	1	N.A.	N.A.	Analog (FM)
2	Katsuura	JMA	1986	96	4	3	N.A.	N.A.	Analog (FM)
3	Ito	ERI	1993	28	3	N.A.	N.A.	N.A.	Digital (16bits)
4	Hiratsuka	NIED	1996	127	6	3	N.A.	N.A.	Digital (16bits)
5	Kamaishi	ERI	1996	123	3	2	N.A.	N.A.	Digital (16bits)
6	Muroto	JAMSTEC	1997	125	2	2	1	N.A.	Digital (16bits)
7	Kushiro	JAMSTEC	1999	242	3	2	1	2	Digital (24bits)
8	Omaezaki	JMA	2008	220	5	3	N.A.	N.A.	Digital (24bits)



OBS : Ocean Bottom Seismometer
 PG : Pressure Gauge

JMA : Japan Meteorological Agency
 ERI : Earthquake Research Institute, Tokyo University
 NIED : National Research Institute for Earth Science and Disaster prevention
 JAMSTEC : Japan Agency for Marine-earth Science and Technology

All systems has been functioning without any failure!

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