

● **Earthquake early warning system for factory plant such as semiconductors by "Real-time earthquake information" and "P wave seismograph"**
Earthquake early warning system

Earthquake early warning system instantaneously estimates S wave arrival-time to the place and the seismic intensity from information obtained by the real-time earthquake information and data of locale P wave seismograph.

Combination of the information enables the energy shut down, control of equipments etc. and aural warning of disaster prevention system, before a big earthquake reaches the place. Though it depends on the distance from the epicenter, there is a time of several seconds from receiving the real-time earthquake information and observing locale P wave until S wave attainment. Within this interval, safety can be secured effectively and a lot of secondary disasters can be prevented.

In addition, the announcement of the real-time earthquake information might become after a big shake reaches in the vicinity of the hypocenter of the earthquake directly above its epicenter generated in the inland. Even in this case, locale P wave seismograph can obtain the primary wave before a big shake reaches. An attainment seismic intensity estimation of a locale P wave seismograph and a decision by majority judgment of the plural installation of the systems ensure detection of earthquake occurrence and operates immediately Earthquake early warning system, before the shake.

Iwate and Miyagi inland seismic ground motion work situation of Earthquake early warning system [JBS-01]

The device damage situation [Before installing Earthquake early warning system]

- Installed location : Miyagi Oki Electric Industry Co. Ltd.
at 1 Okinotaira, Ohhira-murqa, Kurokawa-gun, Miyagi Prefecture
- Date & Time : Saturday, June 14, 2008 at about 08:43
- Epicenter : Southern part of Iwate prefecture
- Earthquake size : Depth 10km and magnitude 7.2



Time of occurrence	Delay time [sec]	Events	Actual Intensity of S wave [ga]	Emergency earthquake information of Japan Meteorological Agency		JBS-01[Phase3] installed in Miyagi Oki Semiconductor		Remarks
				Emergency Information (No)	Estimated Value [ga]	Actual Intensity of P wave [ga]	Estimated Value of S wave [ga]	
8:43:45	20	Earthquake Occurrence						According to the final info of Japan Meteorological Agency ND20080614084350
8:43:54	11	Arrival of Emergency Information		First Information	24.557			
8:43:55				Second Information	24.429			
8:43:58				Third Information	35.185			P wave detection → Start calculation Broadcast → Evacuation
8:43:00	5	Arrival of P wave				47.778		
8:43:01	4	Broadcasting start output				47.778	148.748	Start of Broadcast [→ 80gal]
8:43:02				Fourth Information	39.495			Scanner stop Prober stop Stop of automatic transport Shut down of gas & chemicals
8:43:02	3	Control signal output for system shut down				60.677	176.914	
8:43:02								
8:43:04				Fifth Information	62.27	93.706	283.501	
8:43:05				Sixth Information	62.27	93.706	285.002	
8:43:05	0	Arrival of S wave	251					Actual value (Locale seismograph)

Operation situation of Earthquake early warning system due to Iwate in 2008 and Miyagi inland earthquake

