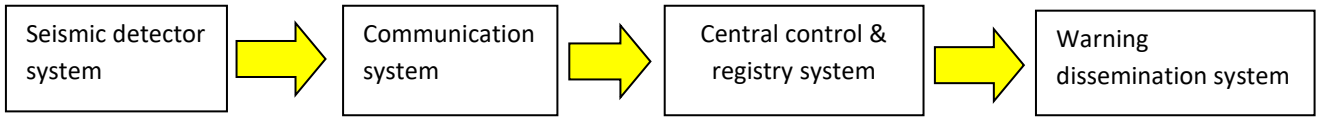
1.14 Seismic Alert System (SASMEX, Mexico)

OECD GP Activity	UN SF Activity	UN SD Goals / Targets
1. Natural hazards identification and communication, NH (early) warning systems	3. Investing in disaster risk reduction for resilience	16.10 Ensure public access to information

Classification according to OECD Guiding Principles, UN Sendai Framework Priorities/Activities, and UN SDGs and Targets

Figure 1: The Mexican Seismic Alert System



Source: © Karl-Erich Köppke

Short Facts:	Natural Hazard(s) Considered:
Governance approach: Hazard warning **Source:** Centro de Instrumentación y Registro Sísmico **Entry into force:** 1991 **Targeted Stakeholders:** Operators, authorities, assessors/safety experts **Scope of applicability:** National	• Earthquake **Climate change:** Not relevant

Description

Mexico City was built on the remnants of what in ancient times was a lake. These remnants are soft clay deposits, which make up most of the city's subsurface nowadays. The area in Mexico with the highest seismic activity is located 350 km west of the capital at the Pacific coast. Under regular circumstances, any seismic waves that reach the city would have lost much of their strength and not cause any severe damage. In spite of the great distance however, the soft clay deposits do not dampen the tremors from earthquakes in the Pacific coast area, but rather amplify them. On the one hand, this means that seismic waves are up to one hundred times stronger when they hit Mexico City. On the other hand, the seismic waves reach the capital with a delay of about 60 seconds compared to the immediate vicinity of the epicentre.

In order to predict or measure an earthquake, alert systems take into account the so-called primary waves (P waves) and secondary waves (S waves). P waves are pressure waves or compression waves which propagate in the longitudinal direction and that travel faster than S waves. The S waves, which move the soil perpendicular to the direction of propagation, have a greater destructive power than P waves. Crucial to an early warning is the fact that the P waves can move at almost twice the speed of S waves This effect is used by the Seismic Alert System of Mexico (SASMEX) to issue a warning of an impending earthquake to Mexico City, as well as a large part of middle and southern Mexico. In order to do so, field stations measure the time between the arriving P and S waves. The results are processed using a simulation program to decide at short notice whether or not to issue a warning. .

SASMEX provides a variety of additional information about earthquakes, including their magnitudes, on a regular basis. Warnings of serious earthquakes are delivered via Twitter as #AlertaSismica (earthquake alert), while all other earthquakes trend under #TenemosSismo, which translates to “we have an earthquake”.

Link/Contact:

http://www.cires.org.mx/index.php

Comments by the UN/OECD Natech-Steering Group:

A rare example of an earthquake warning system. The short prediction time (60 seconds) may limit the response options available to operators of hazardous facilities.

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