**Japan Geoscience Union Meeting 2010**
(May 23-28 2010 at Makuhari, Chiba, Japan)


HDS024-03 Room: Exibition hall 7 subroom 1 Time: May 26 16:00-16:15

# Revision of the long term evaluation method of active faults

Hiroyuki Hasegawa[1*], Sadayuki Kitagawa[1], Kunihiko Shimazaki[2]

[1]Research & Development Bureau, MEXT, [2]Asso. for Earthquake Disaster Prevention

This paper summarizes the revised method for the long term evaluation of active faults, which has been organized in the Headquarters for Earthquake Research Promotion (HERP). The HERP announces the long-term evaluation result (fault location, a scale of the expected earthquake, and a long-term probability of earthquake occurrence) about the major active fault zones in Japan. In 2 005, the HERP arranged some evaluation criteria by the evaluated results, and published as the report on the active fault evaluation method. A subcommittee was established in 2005 for revising the method based on the progress of the investigation technology, increases in data, and the societal demand, which was required in the report. The necessity is also described in "the next Promotion of Earthquake Research" determined in 2009.
The main features of the revised method are as follows: 1) Evaluation of relatively short active faults etc., 2) Comprehensive evaluation of all active faults in the designated area, 3) Evaluation of subsurface fault shape 4) Evaluation of the different scale of earthquakes occurring on a single fault, and 5) Consideration of "earthquakes with less evidence on the surface" in a probability of earthquake occurrence.
On point 1), only the 98 major active fault zones (12 added) are the target of investigation and have been evaluated in the current method. However, unexpected earthquakes such as the 2008 Iwate Miyagi Nairiku earthquake have occurred on tectonic-geomorphologically unrecognized short faults. In the revised method, active faults shorter than 20km and active folds will be considered.
On point 2), evaluation unit has been the major active fault zone in the current method. Many faults, however, will exist in a certain area, and it is necessary to take all faults into account for earthquake disaster prevention. Then, both area-based and fault-based evaluation will be published in the revised method. The former will mainly depict the past activities and the latter the future activities in the area. We plan to divide the country into around 20 areas by tectonic division.
On point 3), the source fault length has been regarded as equate with the surface fault length. Shorter surface ruptures associated with recent inland earthquakes, however, suggest that source fault length may be longer than surface fault length, especially when surface length is short. In the revised method, source fault length will be judged from subsurface structure estimated by gravity abnormality distribution etc.
On point 4), we have considered that the whole of fault segments must rupture simultaneously if there was no faulting history evidence of segmentation. However, in some cases, a seismogenic fault can be divided into a few or more segments each of which have characteristic activities and generate repeated earthquakes. In the revised method, division of longer seismogenic fault into " unit segments" will be considered and both simultaneous movement of multi segments and separated movement of a single one must be evaluated. On shorter faults, estimated source fault length and "a scale of earthquake without specified source faults" must be taken into account.
On point 5), in the current method, mean recurrence interval and the timing of the latest event have been evaluated from paleo-seismicity revealed mainly by trenching survey, and then probability of earthquake occurrence have been calculated. However, in some M7 class

earthquake, no visible evidence of displacement was recorded on the surface, which cannot be found by trenching survey. In such case, long term probability may be underestimated. In the revised method, long term probability must be calculated by giving consideration to "earthquakes with less evidence on the surface" by the fact that 4 inland earthquakes (>= M6.8) out of 12 bring surface rupture.
The newly evaluation of the active fault will start in 2010, and it must stimulate future earthquake disaster prevention.

Keywords: the Headquarters for Earthquake Research Promotion, long-term evaluation,
the major active fault zones, short active faults