

Two major issues to avoid future destruction of HLW repository site from active faulting

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The Agency for Natural Resources and Energy in the Ministry of Economy, Trade and Industry has opened a nation-wide map of the scientific and geologic potential for future high-level nuclear waste repository sites in July 2017. The Ministry intends to promote public understanding of the geologic disposal. Since I have been a member of the geologic disposal technical working group since October 2013, I have a responsibility to explain the background and discussion in making the map and two major issues we will encounter in the future concrete siting process in terms of active faulting. One major problem would be the validation of “process zone” that has been used as a criterion to avoid the future destruction of the HLW repository site. The process zone, defined as widely applied shear zone of an active fault, is borne within a 1/100 width of the fault length (Vermile and Scholz, 1998, JGR). But there has been no detailed discussion whether this criterion can be applicable for the tips of a fault with respect to long-term fault growth process. The other major problem is a risk associated with hidden (blind) faults near a site. For the long-term earthquake evaluation, M⁻⁷ earthquakes are assigned not only to short and minor active faults but also background seismicity without any specific active faults. There are also plenty of triggered slips reported at the recent large inland earthquakes (e.g., more than 200 minor slips off the source faults of the 2016 Kumamoto earthquake detected by InSAR analysis). We thus need to develop techniques and evaluation system for minor and/or hidden faults including their potential growths during the next 100,000 years.

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