

## Problems with active fault evaluation in nuclear safety regulation

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There are various factors behind the underestimation of active faults during the safety review of nuclear power plants. I have disclosed this problem in my books ( “Nuclear Power Plants and Active Faults” published by Iwanami-Shoten in 2013, and “Active Faults and Nuclear Regulation in Japan” , in-edit). In the past, safety review was conducted in two stages—site review and seismic review, and active fault survey was conducted only in the latter. Therefore, we could not use active fault information for site determination. Moreover, the safety regulation rules (Regulatory Guide for Reviewing Seismic Design) were bylaws of government authorities that did not possess external binding power. Furthermore, it allowed arbitrariness in interpreting the definition of active faults. In the above-mentioned case, although problems related to laws and ordinances have improved due to the establishment of New Regulatory Requirements after the formation of the Nuclear Regulation Authority (NRA), the problem of the NRA itself having no authority to investigate remains. In this presentation, I discuss issues of active fault evaluation in safety regulation.

Usually, the construction of nuclear plants should be conducted as follows: (1) determine if an active fault exists in the premises or in the vicinity, (2) estimate earthquake ground motion and ground deformation by active faulting before designing, or (3) avoid. This flow is the basic policy of the NRA examination team that I was a part of, for the New Regulatory Requirements. (3) "Avoid" means moving the location or refraining from constructing at the site. However, there was no corresponding description in the earlier regulatory guide. The New Regulatory Requirements prohibit important facilities from being installed on the outcrop of "faults etc. that may possibly activate in the future". In addition, operating is not permitted unless it meets the requirements. While there have been objections to this, we can discuss again how to better understand "avoiding". However, revising New Regulatory Requirements should be based on social consensus. I will discuss here several scientific subjects regarding (1) "active fault recognition" and (2) "prediction of earthquake motion and displacement".

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