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Important natural geologic hazards to the proposed Corral Canyon nuclear power plant; a review of evidence presented on 16 April 1964 to the Licensing and Regulation staff of the U. S. Atomic Energy Commission.

The following two items are deemed critical to evaluation of the geologic feasibility of the Corral Canyon site and should be re-emphasized at this time:

- (1) Indirect evidence of tectonic activity in the site; and
- (2) Active landslides that affect offshore installations.

Tectonic activity.--The tectonic stability of the Corral Canyon site is evaluated in terms of indirect evidence of faulting and earthquakes associated with the general trend of the Malibu Coast fault, which traverses the site; the site area does not contain the critical evidence. The Malibu Coast fault itself has ^{obviously} not moved at the ground surface in probably the last 100,000 years; it is buried at several places near Corral Canyon by rocks at least that old. However, between 15,000,000 and about 400,000 years ago the fault was the locus of major thrusting, which resulted in offset of several thousand feet. During this thrust faulting the rocks of the Continental Borderland offshore (Yerkes and others, 1964, fig. 1) moved northward under rocks of the Santa Monica Mountains.

The rocks of the Continental Borderland are currently moving northward, as indicated by abundant seismic and geologic evidence along its east boundary fault in the western Los Angeles basin, the Newport-Inglewood zone. Evidence for continuing movement along the Malibu Coast

fault at the north boundary of the Continental Borderland includes (1) numerous epicenters of magnitude 2 to 5 shocks on or near the fault; and (2) faulted upper Pleistocene terrace deposits in at least seven known localities near and along the general trend of the Malibu Coast fault within 3.8 miles west and 9.6 miles east of Corral Canyon (Yerkes and others, 1964, fig. 4). The upper Pleistocene terrace deposits are the youngest rocks in the general area that would be expected to preserve clear evidence of faulting; they are offset at locality 2 as much as 120 feet. This faulting occurred sometime between about 400,000 years ago and the beginning of historic records for the area, about 200 years ago.

The continuing northward movement of the Continental Borderland under the Santa Monica Mountains has not resulted in perceptible movement on the Malibu Coast fault, nor in the formation of a major younger fault on land. However, some of the movement has resulted in the seven less continuous faults cited above. Other even less perceptible movement may be taking place at depth along the general trend of the Malibu Coast fault. The rocks at depth are probably accumulating elastic strain that will ultimately result in earthquakes and perhaps renewed faulting ^{at the ground surface.} Movement is probably also being absorbed as plastic deformation at depth, the effects of which include intense, pervasive shearing such as that exhibited by rocks of the proposed construction site. Finally, movement may be resulting in undetectable tectonic offset at depth. Thus, even though detectable faulting has evidently not occurred at the surface near the Malibu Coast fault in the last 200 years, considerable evidence indicates its future likelihood.

Probably

The intensely folded and pervasively sheared rocks at the mouth of Corral Canyon, in which the reactors will be founded, are clearly part

of the band of rocks that have been intensely deformed by movement on the Malibu Coast fault due to northward ^{under} thrusting of the Continental Borderland (Yerkas and others, 1964, figs. 4 and 5, cross sections). These relatively weak rocks will be a preferred locus for any future fault offsets related to deformation along the trend of the Malibu Coast fault in the site area.

Landslides.--The proposed construction site is not threatened directly by major natural landslides. Indirect threats are posed by possible landslide damming of Corral Canyon upstream from the proposed construction site. Heavy rainstorms could then result in severe damage from floods and debris.

*Following due to
landquake*
The toes of the two large, active landslides that flank the mouth of Corral Canyon are under water offshore and have not been located. Until the location of these toes is clearly delineated, it must be assumed that the offshore water lines will traverse active landslide deposits and will presumably be founded on them in part.

Reference:

Yerkas, R. F., Kachadoorian, Reuben, and Wentworth, C. M., Preliminary geologic report on the proposed Corral Canyon nuclear power plant site, Los Angeles County, California: unpub. U.S. Geol. Survey report, 1964.