SEISMIC-RESISTANT DESIGN OF NEW TREATMENT FACILITIES AND PUMP STATIONS

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This paper discusses new treatment facilities, wells, and pump stations including seismic and geotechnical evaluations, foundations, siting, intakes, outfalls, vaults, conduits, channels, equipment, instrumentation and controls, and power supplies. It is divided into five technical sections: system planning; foundations and buildings; channels, large conduit, vaults, and piping; equipment; and wells, intakes, and outfalls.

Each technical section considers available criteria, methods, and techniques for the design and construction of seismic-resistant facilities. Any ongoing activities are mentioned. General reference sources are identified in a sixth section.

The seventh section addresses problems and issues in need of attention. The final section makes recommendations to address the problems previously identified in terms of what should be done, how it should be done, who should do it, and the associated cost.

Retrofitting of existing facilities is not discussed nor are geotechnical considerations including lateral soil pressures, liquefaction, settlement, and slides. Power supply is addressed only as it relates to on-site emergency power generation and redundancy. Communication facilities are included only to the extent needed to indicate their critical nature. Neither tanks nor tank appurtenances (buried, ground level, elevated, of steel or concrete) are addressed herein.

SYSTEM PLANNING

Siting

Seismic concerns in siting facilities are one of many considerations to be taken into account. Potential surface ruptures, magnitude of ground motion accelerations, and local soil stability all must be considered. Assessments must be made comparing potential sites for their relative seismic risk and the costs associated with achieving the level of resistance to an earthquake event. Extensive work in siting facilities has been done in the nuclear industry. Although in siting facilities