

Operational Policy

Safety of Dams

Note: OP and BP 4.37 replace OMS 3.80, *Safety of Dams*. Questions should be addressed to the operations advisers, Operations Policy Group, OPR.

1. For the life of any dam, the owner¹ has full responsibility for the safety of the dam, irrespective of its funding sources or construction status. Because there are serious consequences if a dam does not function properly or fails, the Bank² is concerned about the safety of new dams it finances and existing dams on which a Bank-financed project is directly dependent.

New Dams

2. When the Bank finances a project³ that includes the construction of a new dam, it requires that the dam be designed and its construction supervised by experienced and competent professionals. It also requires that the borrower adopt and implement certain dam safety measures for the design, bid tendering, construction, operation, and maintenance of the dam and associated works.

3. For small dams (normally those less than 15 meters in height, such as farm ponds, local silt retention dams, and low-embankment tanks), generic dam safety measures designed by qualified engineers are usually adequate. For large dams—that is, dams that are 15 meters or more in height, or are between 10 and 15 meters and present special design complexities (e.g., an unusually large flood-handling requirement, location in a zone of high seismicity, or foundations that are complex and difficult to prepare)⁴—the Bank requires

- (a) reviews by an independent panel of experts throughout investigation, design, and construction of the dam and the start of operations;
- (b) preparation and implementation of detailed plans: a plan for construction supervision and quality assurance, a plan for instrumentation, an operation and maintenance plan, and an emergency preparedness plan;⁵
- (c) prequalification of bidders during procurement and bid tendering;⁶ and
- (d) periodic safety inspections of the dam after completion.

4. The independent review panel consists of three or more experts, appointed by the borrower and acceptable to the Bank, with expertise in the various technical fields relevant to the dam safety aspects of the particular dam.⁷ The primary purpose of the panel is to review and advise the borrower on matters relative to dam safety and other critical aspects of the dam, its appurtenant structures, the catchment area, the area surrounding the reservoir, and downstream areas. However, the borrower normally extends the panel's composition and terms of reference beyond dam safety to cover such areas as project formulation; technical design; construction procedures; and associated works such as power

¹ The owner of a dam may be a national or state government, a parastatal, a private company, or a consortium of entities.

² "Bank" includes IDA, and "loans" includes credits.

³ For example, a hydropower, water supply, irrigation, flood control, or multipurpose project.

⁴ For a full definition of "large dams," see the World Register of Dams, published by the International Commission on Large Dams and updated periodically.

⁵ **BP 4.37, Annex A**, sets out the content of these plans and the timetable for preparing and finalizing them.

⁶ See **Guidelines: Procurement under IBRD Loans and IDA Credits** (Washington, D.C.: World Bank, 1995).

⁷ The number, professional breadth, technical expertise, and experience of panel members are appropriate to the size, complexity, and hazard potential of the dam under consideration. For high-hazard dams, in particular, the panel experts should be internationally known experts in their field.

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facilities, river diversion during construction, shiplifts, and fish ladders.

5. The borrower contracts the services of the panel of experts and provides administrative support for the panel's activities. Beginning as early in project preparation as possible, the borrower arranges for periodic panel meetings and reviews, which continue through the investigation, design, construction, and initial filling and start-up phases of the dam. The borrower informs the Bank in advance of the panel meetings, and the Bank normally sends an observer. After each meeting, the panel provides the borrower a written report of its conclusions and recommendations, signed by each participating member; the borrower provides a copy of that report to the Bank. If there are no difficulties in the filling and start-up of the dam, the borrower may disband the panel of experts after that phase.

Existing Dams and Dams under Construction

6. The Bank frequently finances the following types of projects that do not include a new dam but will rely on the performance of an existing dam or a dam under construction (DUC): power stations or water supply systems that draw directly from a reservoir controlled by an existing dam or a DUC; diversion dams or hydraulic structures downstream from an existing dam or a DUC, where failure of the upstream dam could cause extensive damage to or failure of the new Bank-funded structure; and irrigation or water supply projects that will depend on the storage and operation of an existing dam or a DUC for their supply of water and could not function if the dam failed. For such projects, the Bank requires that the borrower arrange for one or more independent dam specialists to (a) inspect and evaluate the safety status of the existing dam or DUC, its appurtenances, and its performance history; (b) review and evaluate the owner's operation and maintenance procedures, and (c) provide a written report of findings and recommendations for any remedial work or safety-related measures necessary to upgrade the existing dam or DUC to an acceptable standard of safety.

7. The Bank may accept previous assessments of dam safety or recommendations of improvements needed in the existing dam or DUC if (a) the dam or DUC is located in the same country as the subject project; (b) an effective dam safety program is already in operation there; and (c) full-level inspections and dam safety assessments of the existing dam or DUC have already been conducted and documented.

8. Necessary additional dam safety measures or remedial work may be financed under the proposed project. When substantial remedial work is needed, the Bank requires that the borrower (a) employ competent professionals to design and supervise the work, and (b) prepare and implement the same reports and plans as for a new Bank-financed dam (see para. 3(b)). For high-hazard cases involving significant and complex remedial work, the Bank also requires that the borrower employ a panel of independent experts on the same basis as for a new Bank-financed dam (see paras. 3(a) and 4).

9. When the existing dam or DUC is owned and operated by an entity within the country other than the borrower, the Bank requires that the borrower cause the owner to perform the measures set out in paras. 6, 7, and 8.