

Reclamation Manual

Directives and Standards

Subject:	Review of Operation and Maintenance (RO&M) Program Examination of Associated Facilities (Facilities Other Than High- and Significant-Hazard Dams)
Purpose:	To provide program requirements and procedures for uniform Bureau of Reclamation implementation of the periodic reviews/examinations of Reclamation water-related associated facilities. The benefits of this Directive and Standard (D&S) are that the reviews/examinations are integral in protecting the Federal investment (asset management) and public interests related to these facilities.
Authority:	Reclamation Act of 1902 and amendatory and supplementary acts (ch. 1093, 32 Stat. 388)
Approving Official:	Director, Policy and Program Services (PPS)
Contact:	Maintenance Services Office, 84-57000

1. **Introduction.** The RO&M Program was established by Reclamation in 1948 as a periodic review and field examination program of constructed project facilities and systems. The primary objective of the program and related field examinations continues to be the promotion of a preventive maintenance philosophy to identify deficiencies and issues at an early stage, and through recommended actions, avoid more significant concerns such as service interruptions, structural failures, and extraordinary operation and maintenance (O&M) activities. By avoiding such concerns, the service lives of these structures, facilities, and systems can be lengthened, and the need for significant outlays by Reclamation and/or the related operating entity (and associated water users) can also be avoided.
2. **Applicability.**
 - A. This D&S applies to all associated facilities as defined in Paragraph 3. A listing of the various types of associated facilities is outlined in Paragraph 5.A.
 - B. This D&S will apply to all existing and new associated facilities which have been transferred from construction status to O&M status.
 - C. It is important to note that this D&S applies to all associated facilities regardless of whether the O&M responsibility has been transferred to an operating entity or if the responsibility remains with Reclamation operating staff.
3. **Definitions.** In lieu of the historic division of Reclamation facilities under the RO&M Program of “major” and “minor” facilities, features will be separated into two groups:

Reclamation Manual

Directives and Standards

- A. **High- and Significant-Hazard Dams.** All dams presently classified as high- and significant-hazard dams under Reclamation's Safety Evaluation of Existing Dams (SEED) Program, where failure or misoperation of the dam would probably cause loss of human life or would cause appreciable economic, environmental, or lifeline losses (rural area with notable agriculture, industry, work sites, or outstanding natural resources). For these dams, a single formal examination will be conducted, meeting the objectives of both the RO&M and the SEED Programs. The D&S governing the examinations (facility reviews) of these dams is Reclamation Manual, *Review/Examination Program for High- and Significant-Hazard Dams*, [FAC 01-07](#).
- B. **Associated Facilities.** All remaining Reclamation facilities other than high- and significant-hazard dams, as outlined in this D&S. The name "associated" is not to infer association, in all cases, with the dams within the first group. Each region has the option of dividing this group of facilities to allow for clarification of office roles and responsibilities.
4. **Responsibilities.** Responsibilities for proper administration of the Associated Facilities RO&M Program will be shared by different levels of the organization as follows:
- A. **Director, PPS.** The Director, PPS is responsible for providing intra-agency coordination; establishing related Policy, D&S, and guidance; and coordinating and providing workshop and training opportunities for Reclamation offices.
- B. **Regional Directors.** Regional directors, or their delegate, are responsible for implementing this D&S, overseeing and coordinating the regional program, and ensuring that area offices conduct appropriate examinations of associated facilities under their jurisdiction.
- C. **Area Managers.** Area managers, or their delegate, are responsible for the day-to-day management activities associated with administering the Associated Facilities RO&M Program. Area managers, or their delegate, will collaborate with operating entities of transferred works on all aspects of program coordination, scheduling, and accomplishment of the field examinations.
5. **Program Implementation.**
- A. **Listing of Facilities.** Each area office will maintain a comprehensive inventory or listing to confirm that all Reclamation facilities (either by ownership or included as part of an authorized Reclamation project) are examined regularly under the RO&M Program. The following facilities must be included on the inventory:
- (1) carriage, distribution, and drainage systems;
 - (2) pumping and pump-generating plants;

Reclamation Manual

Directives and Standards

- (3) powerplant structures;
- (4) tunnels/pipelines;
- (5) diversion and storage dams (low hazard);
- (6) type 2 bridges;
- (7) regulating reservoirs (low hazard);
- (8) fish passage and protective facilities, including hatcheries;
- (9) river channelization features;
- (10) rural/municipal water systems;
- (11) desalting and other water treatment plants;
- (12) maintenance buildings and service yards;
- (13) facilities constructed under past loan programs (until paid out); and
- (14) recreation facilities (reserved works only).

B. Clarification of Certain Facilities.

- (1) **Pumping and Pump-Generating Plants.** All pumping plants and pump-generating plants, with the exception of reserved works' pump-generating plants, will be covered under the Associated Facility RO&M Program. [Reserved works' pump-generating plants will be covered under Reclamation Manual D&S, *Power Review of Operation and Maintenance (PRO&M) Program*, [FAC 04-01](#).] This will include determining examination frequency, examination scheduling, applicable funding, distribution of examination report, tracking of recommendations, etc.
 - (a) For those plants having a total plant capacity of 2500 Hp or more, each of the plants and installed equipment will be examined as part of the regularly scheduled RO&M examination of the related facilities. In some cases, due to their size and complexity, a separate RO&M examination of some of the larger plants will be necessary.
 - (i) This site visit will include a review of O&M related to the structural, electrical, mechanical, and operational aspects of the plant.

Reclamation Manual

Directives and Standards

- (ii) These plants will be examined at least once every 6 years. Each responsible area and/or regional office will determine the frequency based on the following factors:
 - (aa) O&M condition of the plant and installed equipment;
 - (bb) adequacy of O&M by responsible operating entity;
 - (cc) relative size and complexity of plant and installed equipment; and
 - (dd) criticality of plant operation (impacts, consequences, etc.).
 - (iii) Each responsible area and/or regional office will determine the appropriate technical expertise to include on the examination team. For some of the larger pumping and pump-generating plants, specialized PRO&M personnel must be included on the team. In such cases, close coordination is encouraged to secure the necessary resources and to coordinate the examinations with those being conducted on plants in the same geographical area, to the extent possible, for efficiency purposes.
- (b) For those plants having a total plant capacity of less than 2500 Hp, depending on the number involved, it may not be feasible to examine each and every plant and its installed equipment as part of the regularly scheduled RO&M examination of related project facilities. If not feasible, a representative number of these plants will be reviewed during the examination, which will be performed at least once every 6 years. As such, an attempt will be made to rotate the examination amongst the plants to include a different set of representative plants during each future examination.
- (2) **Powerplants.** “Structural” features of powerplants will be covered under the Associated Facility RO&M Program, unless covered alternatively under the PRO&M Program. Each region has the responsibility to coordinate this aspect of the reviews between the two programs. When covered by the PRO&M Program, the review team will include specialized “water O&M review” personnel to address these structural features. All other aspects of powerplants (i.e., electrical, mechanical, operations, and management) will be covered explicitly under Reclamation Manual D&S, *Power Review of Operation and Maintenance (PRO&M) Program*, [FAC 04-01](#).
- (3) **Low-Hazard Dams/Regulating Reservoirs.** Examinations of low-hazard dams and regulating reservoirs will include a review of changed downstream site conditions which could possibly affect the dam’s/reservoir’s hazard classification. As appropriate, the following statement is to be included in the report: “There

Reclamation Manual

Directives and Standards

have been no significant changes to affect the low-hazard classification.” Otherwise, the report will document any changed conditions and the Dam Safety Office will be notified of any appreciable observations downstream of these dams/reservoirs that could result in the need for a reassessment of the hazard classification (to a high- or significant-hazard classification).

- (4) **Type 2 Bridges.** A comprehensive bridge inventory will be maintained within each region for all bridges outlined Reclamation Manual D&S, *Bridge Inventory and Inspection Program*, [FAC 07-01](#). All Type 1 bridges (Reclamation-owned bridges located on a public road) will receive an inspection separate from RO&M examinations under the Bridge Inventory and Inspection Program. The review of Type 2 bridges (Reclamation-owned bridge that is not located on a public road [i.e., access to the road/bridge is restricted by some physical device(s) or barrier(s)]) will be included as part of regularly scheduled RO&M examinations of associated facilities, as applicable. (Where it is impractical to include the inspection of all Type 2 bridges as part of the RO&M examination because of the number involved, refer FAC 07-01 for the alternative approach.) All observations, results, and recommendations related to these bridges will be detailed in the corresponding RO&M examination report for that particular associated facility. If a more thorough bridge inspection is required, this inspection will also be conducted similar to other associated facilities within this D&S; however, the results of any follow-up (special) bridge inspections are encouraged to be documented in a report format similar to that used for Type 1 bridges.
- (5) **Recreational Facilities (Reserved Works Only).** These facilities must be included as associated facilities in order to obtain information and data to use in establishing a Facility Condition Index (FCI. Reviews of these facilities will be made by a region/area office recreation specialist, accompanied by other technical specialists, if so requested. For efficiency purposes, these reviews are to be made in conjunction with the RO&M examinations of other associated facilities, as part of a facility review, or as a separate site visit. The recreation specialist will be responsible for coordinating report preparation (with appropriate input from team members) and the tracking of related recommendations. These recreation facilities and any resulting recommendations from these reviews/examinations must be entered into Dam Safety Information System (DSIS) for tracking purposes.
- C. **Funding.** All program costs related to the conducting of regularly scheduled RO&M examinations of associated facilities (including coordination, scheduling, examination preparation, travel, per diem, site examination, report preparation, and transmittal costs) will be non-reimbursable and funded accordingly.

Reclamation Manual

Directives and Standards

- (1) **Rationale.** Reclamation has a responsibility to ensure that its water-related facilities (Federally funded facilities and those included as part of an authorized Reclamation project) are effectively operated and maintained. Whether or not O&M have been transferred to a water user organization, Federal investment and ownership in these facilities has an inherent liability (design/construction) and there is a need to safeguard related public interests relative to their operation. To adequately protect these interests, and for responsible asset management purposes, a periodic review of the condition and associated activities of these facilities is necessary. Based on these intended purposes and benefits, program costs will be non-reimbursable.
- (2) **Exceptions.** Any review activities performed at the time of the RO&M examination that are not considered to be related to the evaluation of the O&M aspects will be funded with or by other review program funding or cost recoverable similar to other project O&M activities. Additionally, expenses incurred by the operating entity, as applicable, in participating in the RO&M site examination will be borne by the operating entity.
- (3) **Special Inspections.** The term “special inspection” is considered to mean any other site visit (beyond the regularly scheduled RO&M examination) to evaluate a particular concern(s) or problem(s) and provide assistance relative to any corrective action (either as a follow-up to an RO&M examination or when requested by the water user organization). When such a special inspection of a specific structure or facility is conducted, it will be made by representatives of the regional and/or area office(s) and, if requested, by appropriate technical personnel from the Technical Service Center (TSC). All such special inspections will be non-reimbursable, similar to the funding of regularly scheduled RO&M examinations.
- (4) **Requested Work/O&M Activities.** Requests by a water user organization for consultations, design services, or modification reviews, and the completion of any O&M activities identified in the formal recommendations resulting from the examination (unless otherwise noted) are to be funded as project O&M costs and reimbursable in the same manner as current project O&M allocations.
- (5) **Contract Language.** General contract language (contained in water repayment contracts, water service contracts, O&M transfer agreements, etc.) varies considerably regarding the reimbursement of periodic inspections of Reclamation facilities. The use of non-reimbursable funding to cover the costs of RO&M examination activities, as described in this D&S, will take precedence over this general contract language, except where the contract specifically requires the reimbursement of “RO&M Program” costs.

Reclamation Manual

Directives and Standards

6. Examination Purposes and Content.

A. **Purposes.** RO&M examinations will be conducted to:

- (1) ensure facilities continue to provide authorized project benefits;
- (2) ensure facilities are operated effectively (excluding powerplants);
- (3) protect public interests, safety, and the environment;
- (4) minimize liability to the Federal Government;
- (5) improve water management/conservation;
- (6) monitor effectiveness of other program issues related to O&M of the facilities;
- (7) promote technical exchange of information;
- (8) maintain familiarity with facilities/training of staff; and
- (9) verify O&M-related compliance with contract (water repayment contract, water service contract, O&M transfer agreement, etc.) provisions.

B. **Content.** As illustrated by the following list, the examination is expected to be representative of both the traditional O&M activities and more contemporary (environmental and public interest) types of issues. Examination content will encompass the following issues, as applicable, with the primary focus being on the traditional O&M activities:

- (1) condition of the facilities;
- (2) emergency and replacement reserve fund status and adequacy (as may be contractually required);
- (3) water operations;
- (4) water management and conservation;
- (5) operating personnel safety requirements and procedures;
- (6) hazardous materials management;
- (7) operational problems (e.g., urbanization, crossings, right-of-way encroachment);

Reclamation Manual

Directives and Standards

- (8) maintenance management/practices;
- (9) operating procedures/documentation;
- (10) operator training (adequacy/needs);
- (11) emergency preparedness/management, including contingency plan documentation and notification procedures;
- (12) universal accessibility;
- (13) public safety and site security;
- (14) pest management;
- (15) inventory of Government-furnished equipment;
- (16) endangered species;
- (17) habitat/wetlands;
- (18) environmental impacts; and
- (19) compliance with mitigation.

C. **Coordination with Other Programs.** To avoid unnecessary duplication of review activities of some of the above issues by other existing programs, coordination will be made as necessary by involved staff between the RO&M Program and other pertinent programs.

D. **Emphasis.** In order to provide a proper blend of O&M aspects during these examinations, an increased emphasis will be placed on the “operations” aspects, especially how the operations involve public interests, and where the existence of the facility could potentially impact public safety and/or personal property in the event of failure of the facility (e.g., canal breach above a housing development). Other issues, such as hazardous materials management, pest management, public safety and awareness, and a review of written emergency operating instructions will be addressed to the extent determined by the examination team’s experience and knowledge of those issues, and the relevance to the examination. When known and deemed appropriate, specialized expertise will be requested and utilized as part of the examination process.

Reclamation Manual

Directives and Standards

7. Examination Procedures.

- A. **Conducting Office.** Examinations will be conducted by at least one office removed from the operating office/entity or an independent review will be made. For associated facilities operated and maintained by a water user entity, examinations will generally be conducted by the area office. If more impartiality is necessary, options are to use the TSC, regional office, or another area office. For associated facilities operated and maintained by Reclamation, examinations will be conducted by the regional office; however, the regional director may also approve examinations be conducted by the area office, the TSC, or another regional or area office provided that the conducting office is one office removed from the operating office. The area manager will invite at least one representative of users/customers who have the responsibility for all or part of the facility's O&M costs to participate, at their own expense, as a member of the team conducting the examination. This representative(s) will be involved in the examination process from start to finish, including the development of specific O&M recommendations. However, the Reclamation examination team lead will determine the final recommendations to be included in the examination report. Participation in the examination activities by users/customers will be subject to applicable security and safety considerations. Users/customers will be informed that the number of representatives may need to be limited and will be determined on a case-by-case basis by the area office representatives involved in the examination.
- B. **Job Hazard Analysis (JHA).** To help ensure the safety of personnel conducting the examinations, the responsible area office, or its delegate, will prepare a JHA for each facility/system to be examined. The JHA will address all potential safety hazards for activities anticipated and correspondingly provide acceptable methods, procedures, and/or equipment to safely accomplish the activities. The JHA will also address any applicable Hazardous Energy Control Procedures as required by the Hazardous Energy Control Program (HECP, FIST Volume 1-1). Personnel and resources are not to be considered protected until HECP procedures have been implemented. All examination team participants must be trained with a working knowledge of HECP and local- and site-specific procedures prior to entering areas controlled under a designated HECP procedure. The JHA will be provided to each examination team participant prior to the examination to allow review and to provide an opportunity for participants to obtain the necessary safety equipment. The JHA will be reviewed by the examination team members at the facility site during the entrance briefing for the examination and signed by all participants in the examination. Signing the JHA will indicate acknowledgment of the provisions and intention to comply with the JHA during the examination. Any non-Reclamation participants declining to sign the JHA will be so noted on the JHA. Should unforeseen circumstances arise during the examination that are not specifically covered in the JHA or where an interpretation is required, the responsible area/field office representative participating in the examination (in consultation with the operating entity, as applicable) will have final authority on whether and how to proceed. Ultimately each individual has responsibility for his/her own safety.

Reclamation Manual

Directives and Standards

C. Duration/Exception.

- (1) Examinations will continue on these associated facilities as long as the Federal Government holds title or the facilities remain an integral part of an authorized Reclamation project. However, if all of the following conditions are satisfied, an exception may be made and the examinations can be terminated:
 - (a) The construction repayment contract is fully paid out.
 - (b) Applicable contracts with the water user entity do not specifically require that examinations be performed on a periodic basis.
 - (c) The facilities do not involve any significant public interests (operational liability, public access and safety, water operations for environmental purposes, water deliveries for international water users, water deliveries to multiple water users, etc.) which require Reclamation oversight.
 - (d) There are no outstanding (incomplete) category 1 and 2 RO&M recommendations.
 - (e) There is mutual agreement between the water user entity and Reclamation to terminate the examinations.
- (2) If such conditions are met and termination of future examinations is agreed upon by the water user entity and Reclamation (regional and area office), the decision will be documented and distributed to all involved parties and Reclamation offices, including PPS, Attention: 84-57000.

D. **Frequency.** Examination frequency may vary from 1 to 6 years, as recommended by the responsible Reclamation office, but will not exceed 6 years. Where possible, for efficiency purposes, the frequency will be set to accommodate other required field evaluations/reviews, such as a water conservation plan review (i.e., every 5 years). Factors to be considered in recommending the next examination date (year) include:

- (1) **the** overall condition of the facility;
- (2) the use of proper O&M practices and procedures;
- (3) the number and seriousness of new and previous incomplete recommendations;
- (4) the operating entity's/office's effort and sincerity in attempting to complete the recommendations, taking into consideration the resources available; and
- (5) the existence of significant public interests relative to the facility's operation.

Reclamation Manual

Directives and Standards

- E. **Related Discretionary Guidance.** Applicable portions of the current version of the “RO&M Field Examination Guidelines” can be used as the basis for conducting these examinations. Additional discretionary guidance in the operation, maintenance, and management of water-related facilities and systems can be obtained by attending Reclamation’s annual Water Management Workshop and from the American Society of Civil Engineers (ASCE) Manual on the Management, Operation, and Maintenance of Irrigation and Drainage Systems (Manual No. 57, 1991), which was developed as a joint effort between ASCE and Reclamation.

8. Examination Reports.

- A. **Content.** Content will encompass applicable issues listed previously under Paragraph 6. Some of the listed issues (e.g., hazardous materials management, pest management, etc.) need only be reported to the extent that they were reviewed/addressed during the examination. A qualifying statement must be included within the examination report to indicate that the examination was not intended to be a full and comprehensive evaluation/assessment of these issues. At a minimum, the examination report will include:

- (1) the author(s) and associated office(s);
- (2) the date(s) of the examination;
- (3) the names and offices of all participants in the examination;
- (4) operational and weather data at the time of the examination which may have an impact on field observations;
- (5) status of previous recommendations (those made during last examination and any others remaining incomplete at that time);
- (6) listing of new recommendations made as a result of the examination;
- (7) definitions of the recommendation categories;
- (8) brief description of facilities examined;
- (9) narrative describing conditions and deficiencies observed during the examination which support the recommendations made;
- (10) documentation of recommendations that have been completed since the last examination;

Reclamation Manual

Directives and Standards

- (11) conclusion statement or paragraph summarizing observations made on the condition of the facilities, including a recommended timeframe/year for next examination; and
- (12) representative photographs of the facility which document pertinent conditions and deficiencies for future reference.

B. Format. Report format will be flexible to accommodate each regional/area office's needs and the content of the examination. However, a simplified standard format is to be developed and used by each office which must contain the information in Paragraph 8.A.(1) through (12).

C. Peer Review. A peer review will be made of the examination report's technical content by appropriate personnel participating in the examination or by the supervisor of the report's primary author.

D. Report Transmittal/Distribution.

- (1) Examination reports will be transmitted within 120 days of the actual examination date, unless justifiable delays exist and are documented by the office authoring the report.
- (2) At a minimum, a copy of the report will be distributed to the following: TSC, Attention: 86-68360; regional director; and all parties involved in the examination, including responsible operating entities outside of Reclamation. The Chief, Dam Safety Office, 84-44000, will be sent a copy of examination reports on low-hazard dams and regulating reservoirs.

9. Recommendation Categorizing and Tracking.

A. Categorizing. Current recommendation categories will be used as defined below:

(1) Category 1.

- (a) Recommendations involving the correction of severe deficiencies where immediate and responsive action is required to ensure structural safety, operational integrity of a facility, or operating personnel/public safety.
- (b) Based on the severity of the deficiency and the condition of the structure/facility at the time of the examination, the examination team will mutually prescribe an appropriate timeframe for completion of the recommendation. Suggested remedial measures will be discussed by the team at the time of the examination and included in the examination report. Within 30 days following transmittal (depending on office conducting the

Reclamation Manual

Directives and Standards

examination) of an examination report containing one or more category 1 recommendations, the responsible regional director will notify all concerned offices (i.e., Director, PPS, Attention: 84-57000 and the Director, Operations, Attention: 96-40000) of the operating office's or entity's plan for accomplishing the work and a scheduled completion date.

(2) **Category 2.**

- (a) Recommendations covering a wide range of important matters where action is needed to prevent or reduce further damage, preclude possible operational failure of the facility, or reduce safety risks to operating personnel/public.
- (b) Such recommendations are intended to be acted upon as soon as practicable following receipt of the corresponding examination report by the operating office or entity. It is desirable that those recommendations that can be included, scheduled, and accomplished as part of the normal O&M Program be undertaken as soon as weather or water conditions allow quality remedial actions. Some recommendations may require a longer time to accomplish because of the need to budget funds, complete designs, or secure equipment, materials, or personnel. In such cases, the related planning and budgeting is to be initiated in a timely manner.
- (c) Any past category 2 recommendations remaining incomplete at the time of the examination will be addressed during that examination and within the corresponding examination report.

- (3) **Category 3.** Recommendations covering less important matters but believed to be sound and beneficial suggestions to improve or enhance the O&M of the project or facility. The status of each category 3 recommendation will be provided in the subsequent examination report. If the recommendation is still applicable, the current year designation will be reassigned to the recommendation number.

B. Tracking. Relative to the tracking of recommendations resulting from the RO&M examinations of associated facilities:

- (1) **Category 1.** Status updates on these recommendations will be provided by the responsible area manager/regional director within DSIS and to the Director, PPS, Attention: 84-57000 and the Director, Operations, Attention: 96-40000, every 6 months (January 1 and July 1) until completed.
- (2) **Category 2.** Status updates on these recommendations will be provided by the responsible area manager/regional director within DSIS on an annual basis.

Reclamation Manual

Directives and Standards

- (3) **Category 3.** Status updates on these recommendations are not required for these recommendations. More frequent tracking of category 3 recommendations is at the option of each responsible area/field office.
- C. **Recommendations in DSIS.** The “O&M Recommendations Table List Form” in the DSIS will be used to maintain the information related to the required tracking/status reports on category 1 and 2 recommendations. Each area office within each region will maintain a current listing of recommendations and their status. Within DSIS, regions will designate each recommendation as an “O” or an “M” to identify them as being “operation” or “maintenance” related. For deferred maintenance reporting purposes, all maintenance-related recommendations on reserved works facilities are to have a current status (including scheduled completion date and estimated cost) entered into DSIS no later than September 1 each year. If such recommendations do not include a scheduled completion date 1 year after the date of the recommendation, the related maintenance activity will automatically be reported as deferred maintenance.
- D. **Annual Summary Report.** A summary report for the prior calendar year will be provided by each region to PPS, Attention: 84-57000, by June 15 each year. The report will summarize the accomplishments and status of each region’s Associated Facilities RO&M Program. This report must include documentation of related examination scheduling and completion; related report preparation; and the effectiveness in accomplishing category 1 and 2 recommendations related to the associated facilities.