

## PREFACE

This operating manual provides instructions and guidance to the Division of Dam Safety and Inspections (D2SI) staff of the Office of Hydropower Licensing (OHL) (including the Regional Offices) in the inspection of projects and the supervision of licenses and exemptions for water power projects under the jurisdiction of the Federal Energy Regulatory Commission (Commission).

The Commission has delegated to the Director, OHL duties and responsibilities related to the licensing of hydropower projects and the supervision of licenses and exemptions issued pursuant to Part I of the Federal Power Act. The Commission and Director, OHL have subdelegated certain authority related to dam safety, public safety, and compliance matters to the Director, D2SI. D2SI comprises the Headquarters Office in Washington, DC and five Regional Offices in Atlanta, Chicago, Portland (OR), New York, and San Francisco. In particular, the Director, D2SI has the authority to require a licensee or exemptee to make repairs to project works and to take any related actions for the purpose of maintaining the safety and adequacy of such works. The five Regional Directors also have delegated authority to take appropriate actions to require repairs and/or modifications of projects, installation of protective devices to protect the public safety, or changes in project operation, as may be necessary to ensure project safety and adequacy of project works and for the protection of life, health, and property.

The operating manual is intended to provide personnel of the D2SI in Washington and the Regional Offices with guidelines and procedures for field inspections of hydroelectric projects and the supervision of licenses and exemptions in accordance with the applicable provisions of licenses or exemptions. It does not include specific details, criteria, and standards because it is not intended to provide extensive information available in handbooks, technical journals, and other publications. The inspectors of projects are professional engineers and geologists and specialists in certain environmental disciplines, with sufficient experience to exercise sound technical judgment in dealing with the specific responsibilities assigned to D2SI by the Commission.

This manual is being made available to the public to provide information on the Commission's program for the inspection of licensed and exempted projects and supervision of licenses and exemptions. The operating manual is normally updated biennial. Revisions will be available to the public.

Constantine G. Tjoumas, Director  
Division of Dam Safety and Inspections

## TABLE OF CONTENTS

		<u>Page No.</u>
Preface		i
Chapter I - General		
1-1	Authority .....	6
1-2	Staff Authority and Responsibility .....	7
1-3	Division of Dam Safety and Inspections, Washington Office .....	7
1-4	Regional Office Functions .....	8
1-5	Public Participation in Staff Inspections .....	10
Chapter II - Inspections and Reports for Projects Under Construction		
2-1	General .....	11
2-2	Types of Construction Inspections .....	11
2-3	Initial Letter After Issuance of License .....	11
2-4	Inspecting Instrumentation and Monitoring .....	12
2-5	Inspecting Environmental Compliance .....	13
2-6	Licensee's Construction Quality Control Inspection Program (QCIP) ....	13
2-7	Construction Plans and Specifications .....	14
2-8	Temporary Construction Emergency Action Plan .....	16
2-9	Construction Inspections .....	16
2-10	Preparation of the Construction Inspection Report .....	16
2-11	After Construction is Completed .....	21
2-12	Additional Considerations and Project Supervision .....	22
Chapter III - Inspections and Reports for Projects in Operation		
3-1	General Instructions .....	25
3-2	Preparation of the Report .....	26
3-3	Conditions Affecting the Safety of a Project or Its Works .....	33
3-4	Unusual Natural Events or Weather Conditions .....	33

TABLE OF CONTENTS (Cont.)

Page No.

Chapter IV - Independent Consultant's Safety Inspections and Reports

4-1	Projects Requiring Consultant's Inspection . . . . .	35
4-2	Significant Hazard Potential Dams . . . . .	35
4-3	General Inspection Requirement . . . . .	36
4-4	Scope of Inspection . . . . .	36
4-5	Report of the Independent Consultant . . . . .	37
4-6	Time for Inspections and Reports . . . . .	37
4-7	Exemption from Filing an Independent Consultant's Report . . . . .	37
4-8	Licensee's Comments on Consultant's Recommendations . . . . .	38
4-9	Review of Consultant's Report . . . . .	38
4-10	Dam Safety Repairs and Modifications Required as a Result of Part 12 . . . . .	41
4-11	Instrumentation . . . . .	42
4-12	Release of Consultant's Report . . . . .	43

Chapter V - Emergency Action Plans

5-1	Purpose . . . . .	44
5-2	Requirement . . . . .	44
5-3	Submission and Evaluation for Adequacy . . . . .	45
5-4	Exemption from Filing an EAP . . . . .	46
5-5	Review and Updating of Plans . . . . .	46
5-6	Annual Inspections . . . . .	47
5-7	Post and Readiness . . . . .	47
5-8	Radiological Emergency Response Plan . . . . .	48

Chapter VI - Monitoring, Inspecting, and Reporting on Environmental and Public Use  
Compliance Matters Related to Licensed Projects

6-1	General . . . . .	49
6-2	Frequency of Inspections . . . . .	49
6-3	Preparation of EPUI Report . . . . .	49

Chapter VII - Inspection and Reports for Exemption Projects

7-1	General . . . . .	56
7-2	Administration of Exemptions . . . . .	56

TABLE OF CONTENTS (Cont.)

Page No.

Chapter VIII - Informal Complaints and Non-Compliance

8-1	General . . . . .	58
8-2	Informal Complaints . . . . .	58
8-3	Coordination with DLC . . . . .	58
8-4	Final Action on Compliance . . . . .	59
8-5	Compliance - General . . . . .	59
8-6	Non-Compliance Procedures for Dam Safety Related Matters . . . . .	59
8-7	Non-Compliance Procedures for Non-Dam Safety Matters . . . . .	59
8-8	Emergencies . . . . .	60
8-9	Ex Parte Rules . . . . .	61

Chapter IX - Unauthorized Construction and Operation

9-1	General . . . . .	62
9-2	Unauthorized Construction Where an Application for License or Exemption, or a Declaration of Intention has not been filed . . . . .	62
9-3	Unauthorized Construction Where an Application for License or Exemption, or a Declaration of Intention has been Filed . . . . .	62
9-4	Unauthorized Construction at a Licensed or Exempted Project . . . . .	63
9-5	Unauthorized Operation . . . . .	63

## Appendices

1. Example of Construction Inspection Report - (file size: 601kb)
- 1-A. Special Article Requiring a Board of Consultants - (file size: 3kb)
2. Operation Inspection Report Format - (file size: 6kb)
- 2-A. Example of Operation Inspection Report - (file size: 2.76mb)
3. Outline for Initial Independent Consultant Inspection Report - (file size: 14kb)
4. Guidelines for Preparation of Emergency Action Plans - (file size: 568kb)
5. Example of EPUI Report - (file size: 10.7mb)
6. Letter on Use of HMR Nos. 51 and 52 for Evaluating Spillway Adequacy - (file size: 4kb)
7. Procedures for Selecting Appropriate Inflow Design Flood (IDF) and Determining Need For Remedial Repair - (file size: 36kb)
8. Part 12 Regulations - (file size: 77kb)
9. Guidelines for Public Safety at Hydropower Projects - (file size: 51kb)
10. Emergency Coordination Plan for Multiple Dam Safety Emergencies - (file size: 9kb)
11. Letter Concerning Significant Hazard Potential Dams - (file size: 7kb)

## CHAPTER I

1-1 Authority. Licenses and exemptions issued under the Federal Power Act (Act) are subject to the requirements of the Act, to the Rules and Regulations of the Federal Energy Regulatory Commission (Commission), and to all the standard and special terms and conditions of each license and exemption.

### 1. Federal Power Act

a. Application Requirements. Section 9 of the Act requires that an applicant submit to the Commission "(a) such maps, plans, specifications, and estimates of cost as may be required for a full understanding of the proposed project. Such maps, plans, and specifications when approved by the Commission shall be made a part of the license; and thereafter no change shall be made in said maps, plans, or specifications until such changes shall have been approved and made a part of such license by the Commission." Section 9 provides the authority to require information on the design and construction of licensed projects so as to assure project safety.

b. Conditions of Licenses. Section 10 of the Act provides "(b) that except when emergency shall require for the protection of navigation, life, health, or property, no substantial alteration or addition not in conformity with the approved plans shall be made to any dam or other project works constructed hereunder . . . without the prior approval of the Commission; and any emergency alteration or addition so made shall thereafter be subject to such modification and change as the Commission may direct. Section 10(c) further provides that the licensee shall maintain the project works in a condition of repair adequate for the purposes of navigation and for the efficient operation of said works in the development and transmission of power, shall make all necessary renewals and replacements . . . shall conform to such Rules and Regulations as the Commission may from time to time prescribe for the protection of life, health, and property." In this regard, the Commission has promulgated regulations (18 CFR, Part 12) to implement a comprehensive dam safety program. For the purposes of ensuring the protection of life, health, and property, exempted projects are considered to be licensed facilities and are therefore subject to the Commission's Dam Safety Program.

2. Standard Terms and Conditions. Among the standard terms and conditions of each license are provisions substantially as follows:

The project including its construction, operation, and maintenance, and any work incident to additions or alterations, whether or not constructed upon lands of the United States, shall be subject to the inspection and supervision of such officer or agent as the Commission may designate, who shall be the authorized representative of the Commission for such purpose. (Underscored provision applies only to that portion of a project proposed for construction.)

The provisions of Sections 9 (a) and 10(c) of the Act, Commission Rules and Regulations (18 CFR Part 12), the standard provisions of the license, and any pertinent special provisions of

licenses form the basis for the supervision of licenses and the implementation of the Commission's dam safety and public safety programs.

1-2 Staff Authority and Responsibility. Certain activities relating to supervision of licenses and exemptions are the responsibility of the Director, Office of Hydropower Licensing (OHL) and Director, Division of Dam Safety and Inspections (D2SI). Effective September 16, 1996, the Chair reorganized the Office of Hydropower Licensing (OHL). OHL's hydroelectric power licensing functions were separated into two Divisions, i.e. D2SI and The Division of Project Licensing and Compliance (DLC), responsible for licensing, compliance and non-dam safety and public safety post license administration. The delegation of authority relating to hydropower licensing functions to the Director, OHL is contained in 18 CFR, Section 375.314 and 18 CFR, Part 12. Commission Order No. 388 issued July 13, 1984 should be referred to for specific changes to Parts 12 and 375. The Director, OHL has the authority to require a licensee or exemptee to make repairs to project works and take any related actions for the purpose of maintaining the safety and adequacy of such works [Section 375.314(t)]. The Director, OHL is responsible for administering the Commission's Dam Safety Program and reports directly to the Chairman [Section 12.4(a)]. The Director, D2SI, and the Regional Directors have the authority to require licensees, exemptees, and applicants to take such actions needed to ensure project safety and to protect life, health, and property pursuant to Section 12.4(b) of the Commission's Regulations and the subdelegation of authority to the Director, D2SI by the Director, OHL. The Director, D2SI and the Regional Director have additional authorities under Part 12 of the regulation attached as Appendix 8 for reference.

1-3 Division of Dam Safety and Inspections, Washington Office. The Director, D2SI, has major responsibilities regarding the supervision of the Commission's dam safety and public safety programs, and the supervision of all licensed and exempted projects to ensure compliance with the terms and conditions of licenses and exemptions. Generally, these responsibilities include:

1. Supervise Regional Offices. Supervises and provides policy guidance to the Regional Offices in the conduct of the Commission's Dam Safety and Public Safety Programs and hydro license administration, and the conduct of compliance monitoring and environmental and public use inspections.
2. Provides Guidance and Policy. Guidance, policy, and technical and administrative assistance are provided to Regional Directors in developing an effective dam safety and compliance inspection program, in promoting and improving the Commission inspection techniques, training of inspection personnel, and in developing uniform standards of inspection.
3. Review Inspection Reports. Inspection reports are reviewed to identify and rectify matters requiring action to ensure dam safety, public safety, and compliance or to meet any other Commission requirements.

4. Furnish Technical Guidance. Furnish technical guidance in unusual or difficult situations to Regional Offices. Washington Office staff may provide special expertise to Regional Offices and, where needed, special part-time consultants may be utilized.

5. Supervise Administration of Part 12 Regulations. Review the Regional Director's evaluation of consultants' safety reports, the adequacy of the consultants' reports, the licensees' proposed plans of action, and the corrective actions proposed.

6. Develop Compliance Procedures. Provide guidance and policy and develop procedures for ensuring compliance with licenses and exemptions particularly as related to dam safety and public safety requirements.

7. Plans and Specifications. Construction plans and specifications are reviewed for adequacy and comments furnished to the licensees.

8. ICODS. Serves as a standing member of the Interagency Committee on Dam Safety (ICODS) to ensure compliance with the Federal Guidelines on Dam Safety, to promote good dam safety practices, and to coordinate dam safety matters with Federal and state agencies.

9. Technical Assistance. Provides technical assistance and engineering support to other OHL Divisions and Commission offices.

1-4 Regional Office Functions. The Regional Directors are responsible for functions that can be performed most effectively, efficiently, and economically in the field. In connection with project administration and the Dam Safety and Public Safety Programs, these are functions which require close contact and cooperation with applicants, exemptees, and licensees; local and state agencies, and field offices of other concerned Federal agencies. Specific functions include the following:

1. Furnish Assistance on Applications. Provide general assistance and information to persons regarding Commission regulations relating to applications for permits, exemptions, and licenses. However, it is the primary responsibility of the Division of Licensing and Compliance (DLC) in Washington, DC to provide such assistance. Therefore, applicants should be encouraged to contact DLC at 202-219-2750.

2. Prepare Reports on Applications. Make studies, perform investigations, conduct inspections, collect field data, and prepare reports as directed by the Director, D2SI for use in the processing of applications.

3. Prepare Reports on Unlicensed Projects. Make studies, perform investigations, conduct inspections, collect field data, and prepare reports as directed by the Director, D2SI on unlicensed projects to assist in determining the jurisdiction of such projects.



4. Present Testimony on Applications. Prepare and present testimony at hearings on dam safety, public safety, or compliance matters or on applications as directed by the Director, D2SI.
5. Compliance. Conducts inspections and takes other necessary actions, as directed by the Director, D2SI, to ensure compliance by licensees and exemptees. Compliance responsibilities are primarily related to public and dam safety matters.
6. Prelicense Inspections and Reports. Inspect and report on the condition of existing project works in connection with the processing of license applications.
7. Preliminary Permits. Maintain liaison with permittees to respond to general questions and direct them, as appropriate, to the Washington Office.
8. Projects Under Construction. Review construction plans and specifications and provide comments to the Director, D2SI. Inspect and report on projects under construction, including rehabilitation work at operating projects, and supervise licenses for compliance with license provisions for safety and adequacy of construction. Review and approve the licensee's construction quality control program. Supervision includes attendance at meetings of boards of consultants.
9. Constructed Licensed Projects. Inspect and report on operating projects and supervise licenses to ensure compliance with their terms and applicable regulations.
10. Exemptions 5 MW or Less. Inspect and report on small hydroelectric power projects, 5 MW or less, where an application for exemption has been made. Once an exemption is granted, conduct follow-up inspections and prepare reports to verify that construction did not start prior to issuance, and to ensure timely start and completion of construction. During construction, conduct periodic inspections of work in progress. During operation conduct inspections to ensure compliance with the terms and conditions of exemptions.
11. Exemption of Small Conduit Facilities. Inspect and report on small conduit facilities, 15 MW or less, to verify that construction did not start prior to issuance, and to determine start of construction and completion of construction when such requirements are contained in the order granting exemption from licensing. Conduct special inspections, as directed by the Director, D2SI, to ensure compliance with exemption requirements.
12. Consultants' Safety Inspection Reports. Review and report on safety inspection reports consistent with current criteria prepared by independent consultants to appraise scope and adequacy of the reports and licensees' and exemptees' proposed actions in compliance with consultants' recommendations.

13. Emergency Action Plans. Review and report on adequacy of emergency action plans. Approve emergency action plans and grant exemptions for such plans when warranted.

14. Recreation, Fish and Wildlife, and Other Environmental Aspects. Inspect, investigate, and report on development, management, and maintenance of recreation, fish and wildlife facilities, and other environmental aspects of projects.

15. Coordination. Coordinate inspection and compliance activities with appropriate Federal and state fish, wildlife and environmental agencies and dam safety officials.

16. Takeover, Surrender, or Relicensing Actions. As directed by the Director, D2SI, make inspections, investigations, studies, and reports in connection with Federal takeover, surrender, or relicensing.

17. Represent Commission. The Regional Director is an authorized representative of the Commission.

18. Special Field Inspections. Conduct special field inspections or prepare reports at direction of the Director, D2SI.

19. Special Assignments. Perform work assigned which is not routine in nature.

20. Protective Measures. Require public safety measures to protect the public utilizing project lands and waters.

1-5 Public Participation in Staff Inspections. It is the general policy of the Division of Dam Safety and Inspections (D2SI) to prohibit the participation of the general public in all staff inspections. Our dam safety, public safety and license compliance activities involve the inspection of projects and project features located in hazardous areas, not open to the general public which could be dangerous to nonprofessional or inexperienced participants.

All information developed as a result of the inspection, including all FERC safety and compliance inspection reports, is considered public information and is available to anyone upon request. Deviations from this policy may be appropriate for special circumstances and should be discussed with the Director, D2SI.

## CHAPTER II

### INSPECTIONS AND REPORTS FOR PROJECTS UNDER CONSTRUCTION

2-1 General. Projects under construction are periodically inspected to assure:

- general conformance with contract plans and specifications
- sound construction practices and satisfactory field supervision and monitoring
- adequate quality control and construction records
- compliance with standard and special license conditions, Commission's regulation, approved exhibits, documents and drawings; and environmental concerns
- adequate attention to environmental concerns.

Major projects under construction are normally inspected by Regional Office personnel once a month; however, more frequent inspections may be required where unusual problems are encountered, and less frequent inspections may suffice during periods of work interruption, winter slowdown, or when the degree of complexity of work in progress indicates less intensive inspection would be appropriate. Unannounced construction inspections may be made when necessary to investigate compliance matters or to ensure that construction activities are consistent with sound engineering practice.

A FERC environmental specialist may accompany the inspecting engineer during a construction inspection to inspect the construction or development of fish and wildlife mitigation and recreation facilities required by the license/exemption, and to ensure that construction practices are adequate to protect environmental concerns.

A transmission line or portion thereof will be inspected when (1) an article of the license specifically mandates certain requirements for inspection including raptor proofing, safety matters, environmental concerns, etc., or (2) when directed by the Director, D2SI.

2-2 Types of Construction Inspections. Construction inspections are performed for new projects, rehabilitation of existing projects, and major modifications to structures that result in a change in the approved project description. Examples of typical construction projects might include, but are not limited to, the installation of rock anchors, placement of mass concrete, replacement of deteriorated concrete, modification of an existing spillway, remedial foundation grouting, construction of earth berms, and the repair of embankment slopes

2-3 Initial Letter After Issuance of License. Within 60 days after the license or amendment is issued, the Regional Director will send an introductory letter to the licensee stating that the Regional Office is responsible for administering the terms and conditions of the license pertaining

to the construction, operation, and maintenance of project structures. For projects that include the construction of a new dam and reservoir, the initial letter will specifically note that an Initial Reservoir Filling Plan (IRFP) is required. When a relicense is issued, there may not be any construction activities involved.

2-4 Inspecting Instrumentation and Monitoring. Instrumentation consists of various electrical and mechanical instruments and systems used to measure pressure, flow rates, stress, strain and movement. Monitoring is the collection, presentation and evaluation of instrumentation data. The purpose of instrumentation and monitoring is to maintain and improve the safety of permanent and sometimes temporary water impounding structures. Instrumentation and monitoring, combined with visual observations, can provide an early warning of many conditions that can contribute to the failure of impounding structures. A more detailed discussion on instrumentation is contained in Chapter IX of the Engineering Guidelines.

An instrumentation and monitoring program is usually recommended during the construction of major projects that include extensive cofferdam arrangements or other large impounding structures, construction of new dams, spillways or embankment structures and the rehabilitation or modification of existing project features. Usually, a detailed description of the types of monitoring devices, their location, and frequency of readings are included in the contract plans and specifications submitted to the Regional Director at least 60 days before the start of construction. Sometimes, a specific plan containing the previous information is prepared and included in the QCIP. All instrumentation specifications and plans should be reviewed for suitability and adequacy to assure that project facilities will be appropriately monitored during project construction. The instrumentation plan should be approved before the installation of monitoring devices.

During each construction inspection, the inspecting engineer reviews and evaluates the effectiveness and adequacy of the instrumentation described in the plans and specifications or the QCIP. The inspecting engineer determines if the specified monitoring devices are installed, if they are functioning properly, and if the planned frequency of readings is followed. If the existing instrumentation plan is deficient or if monitoring devices are malfunctioning, the licensee should be directed to repair or replace the defective devices. When additional instrumentation is required, the licensee should submit a plan for approval of the Regional Director. Usually the licensee's monitoring and interpretation of instrumentation data is included in the monthly construction progress report submitted to the Regional Director. For large amounts of data a separate special report should be prepared. Before the end of construction the licensee should submit to the Regional Director an instrumentation plan for monitoring during the operation of the project. For Construction projects with a Board of Consultants, the instrumentation plan is reviewed by the BOC before submitting it to the Regional Director.

2-5 Inspecting Environmental Compliance. Normally all projects under construction are required to have an approved Environmental Compliance Plan (ECP). The plan is part of the

QCIP and is discussed in detail in Chapter VII of the Engineering Guidelines. The inspecting engineers should study the ECP to become familiar with key items.

During an inspection, the QCIP engineer is interviewed to learn the status of the ECP for the report period. Environmental testing such as turbidity monitoring or minimum flow should be reviewed, if applicable. Problem areas, corrective actions, and the acceptability of the corrective actions should be evaluated.

Erosion and sediment control measures, containment systems, surface drainage control, cut slopes, disposal areas, stock pile areas, borrow areas, and construction roads should be inspected to determine their compliance with the ECP. Mitigation areas and monitoring and maintenance of the area should be discussed and inspected for compliance.

If erosion control measures or the licensee's inspection procedures are inadequate, the licensee should be directed to take appropriate corrective actions.

2-6 Licensee's Construction Quality Control Inspection Program (QCIP). In accordance with Section 12.40 of the Regulations and Article 4 of the Standard L forms for licensed projects, a licensee is required to submit to the Regional Director, for approval, a quality control and inspection program for the construction, repair, modification, or alteration of any project works that is commensurate with the scope of work. Chapter VII of the Engineering Guidelines, "Construction Quality Control Inspection Program", describes the requirements of a quality control and inspection program in accordance with Section 12.40 of the Regulations. The Regional Director should notify the licensee, in writing, well in advance of any construction activity, of this requirement. A final construction report should be submitted for all construction activities related to dam safety. As stated in Subpart E, Section 12.40, Paragraph (b) of the Commission's Regulations if construction is performed by a construction contractor, quality control inspection cannot be done by the contractor, but must be performed by the licensee, the design engineer, or an independent firm, directly accountable to the licensee. The intent of this requirement is to make certain that the personnel responsible for quality control inspection are independent from the personnel who are responsible for the construction. This independence must be maintained for all construction, including projects constructed utilizing the "turn key" approach, i.e., it would not be acceptable for the selected design/construction contractor to inspect its own work. Consistent with Section 12.40 of the Regulations, this requirement should ensure that construction quality control programs remain independent of contractors. A contractual arrangement where fees for the quality control work come from the contractor under the premise that the contractor is to maintain an "arms-length" relationship with the quality control personnel will not be accepted. The licensee's inspection program must be approved by the Regional Director before construction begins. The inspection program organization, and personnel should be the subject of periodic review and evaluation to determine effectiveness and the need for any changes.

Developers and their contractors should implement and maintain appropriate erosion control and other measures to prevent environmental degradation of streams during construction. Developers are reminded of the need for a quality control inspection program and monitoring program and a monthly construction report that addresses means for ensuring proper construction practices that will minimize erosion and other environmental problems during construction. Specifically, developers are reminded:

- (1) To include inspection and monitoring of erosion control and other measures that would be required for the protection of the environmental integrity of streams and other areas affected by construction in their quality control program.
- (2) To include in their monthly construction inspections reports a discussion of erosion control and other measures and their effectiveness. The report should also include a discussion of any instances where sediments or other construction discharges entered the stream(s), the extent of the discharges, an assessment of any damage to the stream(s) and corrective actions taken, including measures to prevent further problems.

2-7 Construction Plans and Specifications. Adequate inspection of projects under construction requires thorough familiarity with the special articles of the license, the license exhibits, and the technical features of construction plans and specifications.

As specified in a special license article, the Director, D2SI and the appropriate Regional Director each receive a set of construction plans and specifications from licensees for each project to be constructed, or an existing project to be modified, 60 days prior to start of construction. Normally the licensee will submit two sets of the plans and specifications to the Director, D2SI-WO and one set to the Region Director. Ideally, the plans should be half-size folios prepared for contract bidding. Shop drawings or details of mechanical and electrical contracts or subcontracts have limited importance due to the extensive oversight of the manufacturing processes. The emphasis of review will focus on structural aspects that could affect the safety and adequacy of the project works.

Construction plans and specifications will be reviewed by both Regional Office and Washington Office personnel, except in those cases concerning projects involving minor modifications to existing structures where the Regional Director at his discretion will solely perform the review and will respond to the licensee with the results of the review.

It must be ensured that the specifications include provisions that require the contractor to be responsible for sediment and other controls, and, if appropriate, that the control measures are consistent with the requirements of the license or exemption. Adherence to the plans, specifications, and erosion control measures is verified by the QCIP.

Licenseses of small hydro developments often utilize the design-construct method of contracting (turn-key) for the construction of proposed developments. This method appears to be economically advantageous to the small developer since the design and construction of a project can proceed simultaneously, thereby saving time. The method, however, may be incompatible with our 60 day requirement for submittal of plans and specifications. To accommodate the design-construct type of contract, the submission of plans and specifications in phases can be accepted. In all cases no construction activity will be allowed prior to staff review of the plans and specifications for the applicable construction activity. However, due to the additional work involved with reviewing projects in phases, phased submittals of the plans and specifications should only be considered when specifically requested by an owner. D2SI will not initiate such a procedure.

When deemed necessary, the licensee will be informed that phased submittals will be accepted under certain conditions. The number of submittals should be kept to a minimum. Each phase must be submitted at least 60 days prior to the initiation of construction for that phase and should be a complete submission for a specific element of construction such as excavation, powerhouse, dam construction, etc. Submittals that do not completely cover the specific element of construction will delay staff review and should be considered incomplete and unacceptable. Finally, to facilitate the timely review of the material, the licensee will be directed to submit with the first submission, a proposed schedule for the submission of the remaining phases.

When reviewing the plans and specifications, D2SI staff will review the basis of design for the project works. The layout of the proposed construction will be compared against the project description and the license exhibit drawings. Any deviations in, a powerhouse location, penstock length and size, dam details, or proposed installed capacity will be noted. The review of the plans and specifications will check that the design meets appropriate criteria and that sound engineering and construction practices are specified for items that may affect the safety and adequacy of the project works. The review should focus on structural details, construction materials, and items that may affect stability or spillway adequacy for the project. Those license articles requiring submittal before the start of construction will be reviewed to ensure that the licensee has complied.

For projects that include the construction of a new dam or the creation or reestablishment of a reservoir, an initial reservoir filling plan will be required for approval prior to initiation of filling activities. Filling plans will also be required for long canals that are a principal project feature. Three copies of the plan should be submitted to the Regional Director for approval at least 60 days prior to initiation of filling activities. The reservoir or canal fill plan is to be reviewed by the Regional Director in coordination with the Director, D2SI. Authorization to begin filling will not be granted prior to review and approval of the filling plan. If the license includes a special article requiring the convening of a Board of Consultants (Board), the plan shall be approved by the Board prior to submission to FERC. Generally, the filling plan should include: a proposed filling rate with definite hold periods for observation, options to control filling, a plan and schedule for the inspection of the structures and instrumentation, a plan to evaluate the

performance of the structure and the instrumentation readings, and the names and qualifications of the individual(s) that will be responsible for the filling phase activities. A formal refilling plan for major maintenance and/or dam safety modification construction may be required when determined as necessary by the Regional Director.

2-8 Temporary Construction Emergency Action Plan. In accordance with Section 12.23(a)(2) of the Regulations, the licensee is required to submit a temporary construction emergency action plan where construction of a temporary or permanent cofferdam or large sediment control structure would create an impoundment that might endanger construction workers or otherwise endanger public health or safety should the impounding structure fail. The temporary construction emergency action plan must be submitted to the Regional Director at least 60 days prior to start of construction for review and evaluation. The TEAP should include a notification list of emergency response agencies, a plan drawing showing the proposed cofferdam arrangement, the location of safety devices and escape routes and a brief description of testing procedures. During field inspections, the inspecting engineer should review the workability of the TEAP and verify that the TEAP is posted at a strategic location visible to all workers. Periodic testing of the plan should take place at least quarterly and be appropriately documented by both the contractor and QC staff.

2-9 Construction Inspections. During the construction inspection, the inspecting engineer (1) inspects and photographs areas of current construction work, (2) interviews the licensee's project engineers to determine the status of construction work, the adequacy of the field supervision and construction practices, and significant problems in construction, (3) evaluates the adequacy of construction records and documentation, quality control testing data, the monitoring of instrumentation devices, and the use of environmental control measures, and (4) verifies and documents important field conditions related to design assumptions especially in foundations. At the close of the construction inspection, a meeting is held with the licensee's project engineer to discuss inspection findings and the need for any corrective actions including an appropriate time to complete the actions. A follow-up letter should be sent to the licensee documenting the agreed-to corrective actions. Subsequent inspections should review the status of corrective actions for the previously observed construction deficiencies.

2-10 Preparation of the Construction Inspection Report. The Construction Inspection Report is the means by which the Regional Office inspector reports the construction progress and related activities observed during each construction inspection performed with emphasis on any changes and problems that develop during construction. The report should discuss the progress of current construction activities, the structural behavior and adequacy of completed or partially completed project features, and provide a continuous record of events and data for future reference. The report must be comprehensive and be adequately documented with referenced color photographs to show major construction activities and conditions. All photographs and attachments should be included with each copy submitted to the Director, D2SI. The Regional Office staff engineer's independent observations, comments, and recommended actions are to be included in the report.



The construction report should include a description of the progress in the construction or development of fish and wildlife mitigation and recreation facilities and other related construction.

The format of the construction inspection report will include the following items as appropriate:

## Summary

### A. General Construction Information

- Scope of Work Description
- Purpose of Construction
- License Requirements Pertaining to Construction
- The Name of Project Designer
- The Name of On-Site Construction Manager
- Construction Schedule
- Name of Contractor
- Estimated Construction Cost
- Project Location/Site Features Map
- NATDAM ID No.
- Hazard Classification

### B. Work Progress and Inspection Observations

For each major construction feature, (powerhouse, spillway, embankments, pipelines, and foundations) discuss the following:

- General Construction Progress
- Site Inspection Observations
- Construction Problems and Unexpected Conditions
- Contractor's Methods and Equipment
- Construction Materials
- Significant Design Changes, Modifications or Additions Which Affect Construction or Dam Safety
- Changes in Plans and Specifications

### C. Quality Control

- Inspection Organization and QCIP
- Adequacy of Construction Supervision
- Sources of Construction Materials
- Material Testing

- Inadequacies or Deficiencies in QCIP or Test Results

D. Instrumentation and Monitoring

- Location and Type
- Data Evaluation

E. Environmental Compliance

- Environmental Compliance Items
- Inspection and Monitoring
- Need for Corrective Actions

F. Special Items of Interest

G. Follow-up Actions

Photograph Location Map and Photographs

The Construction Report should be prepared in accordance with the following instructions, using paragraph numbers and titles given. The Construction Report is a public document, available from the Commission's Office of External Affairs (see Appendix 1 for an example of a construction inspection report).

Summary. Submit general comments on progress and adequacy of the work during the report, highlight major items of interest, note any items of the license not being complied with, and note any matters requiring immediate attention. When applicable, the following should be included in a brief narrative summary to provide quick information on construction progress and problems of importance: Major structures started or completed, including unusual rates of concrete placement and earthwork; Installation of major equipment (started or completed); deviations or changes from the contract schedule which will affect time, money, or manpower; completion or probable completion within the next reporting period of major mileposts such as initial diversion, initial storage or closure, online dates, etc; any significant events or problems encountered or anticipated from labor, weather, lack of materials or drawings, or other reasons; failure of contractor's plant or equipment which would affect progress; and unusual or innovative construction methods.

A. General Construction Information. This report section contains basic project data to describe the nature of the construction. The presentation of data may be pertinent data sheets, summary tables, narrative descriptions, or combinations of these. See the list of bullet items in the construction report outline for examples of typical information. The data may be modified as appropriate for a particular construction project. When a pertinent data sheet is included, it should follow the standard cover page of the report, and a reference should be made in report Section A.

Sources for basic project data are the plans and specifications, the supporting design reports, contract documents, license exhibits, and the QCIP.

B. Work Progress and Inspection Observations. This section of the report identifies the major feature of construction and describes the details of work progress during the report period. The inspecting engineer may describe specific observations about the status of construction activities. The information about work progress should focus on the overall advancements.

For the report period describe any construction problems, changed site conditions, or design changes that delay construction or affect the safety of the project. Discuss the corrective action taken or planned for major construction problems or unexpected conditions. The report should identify construction that is not according to the plans and specifications, and any significant changes made in the plans and Specifications.

Additionally the report should include a short discussion of the status of work progress, as related to the original schedule and estimated quantities, and the status of construction as to percent complete. Construction schedules and progress charts should be included, if available. Report on major factors affecting the contractor's progress, such as weather conditions, lack of materials, labor problems, and equipment breakdowns. Include a statement of opinion whether work is advancing at such a rate that completion within the specified time is achievable. If not achievable, then explain the reason and give an estimated completion date. The inspecting engineer may give an opinion about the adequacy and efficiency of the construction, suggesting whether work is being diligently performed and efficiently managed from the standpoint of labor and construction methods used.

When reporting the progress of work involving foundations, include a description and photographs of foundation conditions and photographs of the foundation. Discuss whether or not the exposed foundation conditions meet plans and specifications and design criteria. Areas of exposed foundations and the special treatments and preparations taken for discontinuities such as faults, joints, cracks, crevices, and other problematic conditions should be identified. The findings of special reports prepared for the foundation or its treatment should be summarized. Note when foundation mapping was completed.

C. Quality Control. Report important information about the quality control activities. Briefly describe the QCIP organization, or refer to a previous report containing the information, and comment on its adequacy. Note any major change that may require revision in the QCIP. Discuss construction practices and procedures related to quality control. Include general information about the quality of concrete form work, placement procedures, and concrete curing, and the method of material placement and compaction in earthfill or rockfill dams. Report on problems or situations where inadequate construction supervision by the contractor results in poor quality work or incorrect construction. Note if the licensee's supervision of the contractor appears adequate to provide satisfactory quality control.

Report the sources of major construction materials. Include a plan drawing showing the location of on-site borrow areas and quarries. Identify the types of concrete, cements, aggregates, and admixtures. Describe all special methods of handling and storing that is used to maintain the quality of construction materials. Pay careful attention to changes in sources of these materials. Material from new sources must have required properties.

Summarize quality control tests including the types and number of tests conducted. Report the applicable testing standard used such as ASTM, AASHTO, and ASME. Test data may be tabulated or graphed for enhanced reporting. Give a brief narrative review of the test data and identify areas with failing tests and the corrective actions required for reworking and retesting. If areas of test failures are exposed at the time of the inspection, they should be photographed and described in the inspection, they should be photographed and described in the report.

Document the on-site test facilities and test equipment. Whenever test equipment is modified or new test equipment is installed, it should be noted in subsequent reports. Field-testing equipment and procedures should be described and compared with the test method requirements. The acceptability of field testing should be discussed in the report.

D. Instrumentation and Monitoring. Instrumentation consists of various electrical and mechanical instruments and systems used to measure pressure, flow rates, stress, strain and movement, and monitoring is the collection, presentation and evaluation of instrumentation data. The construction inspection report should contain a description of the instrumentation installed at a project site that is significant to the construction work. This description should include the location of the instrumentation, the purpose of that instrumentation, and the frequency of monitoring. The report should also include the inspecting engineer's evaluation of the adequacy of the instrumentation and monitoring. Inspection reports should comment on the need for additional instrumentation and whether corrective measures regarding monitoring frequency or techniques are warranted or have been done.

If no instrumentation or monitoring program is present and none is needed at the project, the inspecting engineer should state so. As work progresses, the need for instrumentation should be evaluated, particularly if conditions develop such as seepages, deformations, slides, or other signs of internal distress that may require an evaluation of project safety.

E. Environmental Compliance. The construction report should briefly outline or refer to a previous report containing the key requirements of the licensee's Environmental Compliance Plan (ECP). Include a short evaluation of the effectiveness of the key requirements during the report period. This discussion should include the acceptability of items such as erosion and sediment control measures, containment systems, surface drainage control, cut slopes, disposal areas, stock pile areas, borrow areas, and construction roads. Mitigation areas and monitoring and maintenance of the area should be discussed for compliance. Environmental testing such as turbidity monitoring or minimum flow should be reviewed, if applicable.

If erosion control measures or inspection procedures are inadequate, the licensee should be directed to take appropriate corrective actions.

F. Special Items of Interest. This section includes discussion of other matters of interest not reported elsewhere in the construction report. Typical items are BOC of Consultants meetings, Congressional or media involvement, litigation issues, serious on-site injuries, or unauthorized construction of non-project facilities within project boundaries. In addition, a discussion should be included for events involving other federal, state, or local government agencies, or related environmental groups.

G. Followup Actions. Each item requiring followup action should be summarized in this section, or the followup letter to the licensee should be referenced and included as an attachment.

Photographs. Include a map showing the location of photographs. The photographs are numbered to identify the report number and the sequence they are referenced in the report (e.g., 1-1, 1-2). Captions for photographs should include the date taken and describe the subject viewed.

Construction of non-project facilities within project boundaries such as water or sewage treatment facilities, water supply facilities, thermal power plants, major non-project recreation, residential, or commercial development, or other major non-project facilities, requires Commission approval before initiation of construction. Any ongoing construction of such facilities that have not been approved by the Commission should be reported.

2-11 After Construction is Completed. The inspecting engineer's work after the completion of construction includes the following:

1. Final Inspection and Construction Report. When construction is completed, the inspecting engineer performs a final inspection and prepares a final construction report. He evaluates the overall quality of the completed project and checks for major changes since the previous inspection that would require an amendment to the license. The nameplate rating data from the generators and turbines should be verified against the current approved license exhibits, and any discrepancies should be stated in the final report.

The first page of the final Construction Report should be identified as "FINAL REPORT." Important dates included on the first page are (1) the date of first commercial generation of power; (2) the dates on which subsequent generators went on the line commercially; and (3) the date of completion of the project. The format of the final report may follow that of the usual construction report or else a modified format may be created based on the complexity of the project. A study and review of construction documents may be necessary to include adequate discussion of the significant aspects of construction. Discussions should cover (1) the construction sequence including photographs of major structures, (2) major design modifications

and the reasons required, (3) overall results of quality control testing (deficient work and remedial measures should be reported on), (4) important problems and how they were resolved, (5) surveillance and monitoring of instrumentation, (6) reservoir filling operations if applicable, including a schedule and elevations during filling, and any problems and corrective measures taken, (7) major items discussed by the Board of Consultants and a list of their recommendations, and (8) the inspecting engineer's observations during the final inspection including actions recommended for future operation reports, including environmental developments.

2. Establishing the Commercial On-line Date. If construction involves the addition of new capacity, the licensee should be required to notify the Regional Office of the date declared for commercial operation of each generating unit.

3. Review of As-Built Drawings. The licensee should be advised to submit as-built exhibits drawings for Commission approval within 90 days after construction completion or otherwise as required by a license article requirement. The date of completion of the project is usually the date on which the costs for the project cease to be charged to construction, and begin to be charged to project operation and maintenance accounts.

The licensee submits the as-built exhibit drawings to the DLC for approval. Normally DLC will request the Director, D2SI to provide review comments, who in turn notifies the Regional Director. The review of as-built drawings should include a comparison with the available construction information. If needed the inspecting engineer performs a "plan-in-hand" inspection of the construction project to verify that the structures and major items of equipment are shown correctly on the drawings.

2-12 Additional Considerations and Project Supervision. Following are special issues of construction that the project engineer should consider when supervising a construction project.

1. Start of Construction. A special construction inspection is necessary to verify the start of construction in instances where a specific date to start construction is stipulated in a license order or other FERC directive. However, if no specific date is directed as, for example, if construction is directed to start during a particular year or construction season for a rehabilitation project, then the actual construction start date can normally be determined at the time of the first construction inspection or in conversations with the licensee.

According to the Commission's Regulations, Parts 375.314 (dd) and (ee), the Director, Office of Hydropower Licensing is delegated the authority to revoke an exemption if the exemption holder fails to begin or complete actual construction of the exempted project within the time specified in the order, or terminate a license if the licensee fails to commence actual construction of the project works within the time prescribed in the license. This authority has been subdelegated to the Director, DLC.

2. Meetings of Board of Consultants. A Board of Qualified Independent Consultants, approved by the Director, D2SI, may be required for major projects. The BOC may be required to convene before the start of construction. Appendix 2 contains the text of a special article requiring a BOC. The BOC normally reviews the project design, contract plans and specifications, and project construction, and assesses the construction quality control inspection program, construction procedures and progress, planned instrumentation, and the initial reservoir filling plan.

The BOC meetings provide an excellent opportunity to review project planning, and design and construction. Normally, the inspecting engineer will attend all BOC meetings. Other staff from the Regional Office and the Washington Office may also attend, if appropriate. The licensee should be informed to provide sufficient advance notice to allow attendance plans by D2SI staff.

At least 14 days before the date of the meeting the licensee should furnish an agenda for the BOC meeting and a project status report to the BOC and D2SI. The licensee may be requested to include important topics in the meeting agenda for the BOC's information and comment. In the event of a disagreement between the BOC and the licensee, staff may be required to take an official position.

The licensee should submit the BOC report and a plan and schedule to carry out the BOC recommendations to the Regional Office following the meeting (typically within two weeks). The licensee should maintain a summary list of all BOC recommendations including the status of responsive actions. An updated summary list of BOC recommendations should be submitted with each BOC report. The Regional Director acknowledges by letter, with comment, receipt of the BOC report and the licensee's plan and schedule to carry out BOC recommendations.

3. Construction at Federal Dams. When a license is issued for construction of a project at a Federal dam, the coordination of procedures between the Commission and other Federal agency staffs is necessary for the supervision and administration of activities related to the design, construction, operation, and maintenance of the project.

4. Drawdown Necessary for Project Remediation. If a drawdown is needed for remedial project construction, the licensee should coordinate its plans with state, local, and Federal environmental and resource agencies. The licensee should inform affected residents upstream and downstream of the dam before a reservoir drawdown can be started. The Regional Director will not authorize a reservoir drawdown until documentation has been submitted demonstrating that such coordination has taken place. The Regional Office will notify the licensee that submittal of documentation is required for approval of a reservoir drawdown.

5. Need for License Amendments. When design changes are encountered, the licensee should be advised that the changes may require an amendment to the license. The licensee should be advised to submit a complete description of the design changes to the Director, DLC and to

request a determination if an amendment of the license is required. The inspecting engineer should document the design changes in the construction report.



## CHAPTER III

### INSPECTIONS AND REPORTS FOR PROJECTS IN OPERATION

3-1 General Instructions. Projects in operation are inspected to see that they are being properly maintained to assure the continued safety of the structures, that no unauthorized modifications have been made to the projects, and that the project is being operated efficiently and safely and in compliance with the terms of the license, including compliance with requirements related to environmental matters, public use, and safety (See Chapter VI). All constructed projects for which a license has been issued or an application is pending shall be subject to inspection.

Each licensee/exemptee has the responsibility to ensure that projects are operated and maintained in compliance with Commission regulations and the terms and conditions for any license or exemption, including conditions prescribed by resource agencies for exemptions and consistent with the requirements of Parts 8 and 12 of the FERC regulations.

Normally, all high and significant hazard potential dams will be inspected once a year; however, when unusual conditions are encountered, inspections may be at more frequent intervals. A special inspection of a project may be made following an unusual occurrence, such as an earthquake, slide, a significant change in a seepage condition, or a change that may adversely affect the environment. The operation inspection frequency for licensed and exempted low hazard potential dams will be at least biennially for dams that are 25 feet or higher or have a storage capacity of 50 acre-feet or more. Smaller dams that do not meet the above criteria will be inspected at least triennially. The inspection frequency for conduit exemptions will also be at least triennially. The Regional Director will determine the frequency and priority of low hazard potential project inspections based on workload, resource availability, and project scope.

In the year when an application for relicensing is to be filed, a change in the operation inspection schedule should be made. Operation inspections of project that are due for relicensing should be coordinated to occur after the application for relicensing is to be filed. Such applications are due to be filed two years before the current license expires.

A transmission line, or portion thereof, will be inspected when (1) an article of the license specifically mandates certain requirements for inspection or (2) when directed by the Washington Office.

The Operation Inspection will be conducted and the report prepared by the inspecting engineer. The report will address all aspects of the project including operation, maintenance, public safety and all compliance matters, including administrative, engineering and environmental, and in accordance with the form presented in Appendix 2, pages 1-5 and the instructions detailed in paragraph 3-2.

Reports on field inspections by Regional Office personnel should be submitted to the Director, D2SI. Copies should have all attachments, including photographs. The operation inspection reports are public documents and are available to the public, upon request from the Office of External Affairs.

3-2 Preparation of the Report. The Operation Report should be prepared in accordance with the following instructions, using the paragraph numbers and the titles given. Where individual developments of a multi-development license are separable and include major structures, consideration will be given to completely separate reports for each development. If a single report is prepared including a number of developments, subparagraphs under the basic paragraph headings will be used to discuss the individual developments. The report must be comprehensive while avoiding unnecessary detail, and be adequately documented with numbered photographs to show the condition of the project works. The format for the various sections of the report along with an example operation inspection report appear in Appendix 2 and Appendix 2-A.

Summary. Summarize the principal findings of the inspection, describing the condition of the project works. Note any terms of the license not complied with, and any matters requiring immediate attention. If no significant problems or discrepancies were observed, so state.

Pertinent Data Sheet. A pertinent data sheet summarizing engineering characteristics of the project should be included at the beginning of the report. The data sheet should show information such as the date of the completion, drainage area, gross head, details of the reservoir, types of dams, NATDAM numbers, other structures and features of the powerhouse and hazard potential classification. A general plan and a reproduced copy of an overall aerial photograph, if available, should be included with the report.

A. Safety of the Project.

1. Dam, Dike, and Appurtenant Structures. The observations made during the inspection of each project feature should be discussed. Submit full information, including photographs where useful (photographs will be presented in a separate section of the Operation Inspection Report), on the safety and permanence of all the main project works. Report on any matter which may have bearing on the stability, safety, and permanence of the project structures. The report should cover, any appreciable seepage, deterioration of the constructed works, any unusual overflow conditions due to floods, and major damages to the project works resulting from floods. The report should also cover the observance of oil spills, toxic wastes, and other pollutants to the environment and the need for mitigative action to correct the problem.

Indicate whether any canals, conduits or powerhouses have become impaired due to erosion, seepage, deterioration, settlement, or other causes. Ascertain whether the licensee has made any reports of investigations as to the cause of impairment of the main project works due to unusual conditions, and advise as to the remedial measures proposed by the licensee. Discuss whether the failure of canals or conduits would create a downstream hazard and

the adequacy of maintenance to ensure structural integrity. Identify any hydraulic conduits passing through water retention structures or abutments, exclusive of intake for turbines, and determine if the conduits are being adequately maintained.

2. Instrumentation. Section 12.4 of the regulations requires a licensee to make adequate provisions for installing and maintaining appropriate monitoring instrumentation whenever any physical condition that might affect the stability of a project has been discovered or is anticipated. The instrumentation must be satisfactory to the Regional Director. Additional guidance on this matter is given in Section 4-11 of this manual.

On projects where instrumentation data are submitted by the licensee, such performance data should be summarized and, where applicable, the report should include a review of instrumentation and other performance data. Where appropriate, data should be summarized in graphic form. To adequately report on piezometric data, identify whether the piezometer tip is founded in the foundation of the dam or in the dam itself. It may also be necessary to include proper sections of the dams with elevations properly labeled showing foundation stratification and, in the case of embankment dams, embankment zonation. In addition, precipitation data may be required to ascertain the source of any increased piezometric readings.

3. Downstream Hazard Potential. The hazard potential of dams should be determined in accordance with the discussion in Chapter I, Section 1-2, of the FERC Engineering Guidelines. That discussion is updated below. The Guidelines will be revised accordingly.

The hazard potential of dams pertains to potential for loss of human life or property damage in the area upstream or downstream of the dam in event of failure or incorrect operation of the dam or appurtenant facilities. The hazard potential of a dam does not indicate the structural integrity of the dam, itself, but rather the effects if a failure should occur. The hazard potential assigned to a dam is based on consideration of the effects of a failure during both normal and flood flow conditions.

The hazard potential classification system should be utilized with the understanding that the failure of any dam or water retaining structure, no matter how small, could represent a danger to downstream life and property. Whenever there is an uncontrolled release of stored water, the possibility of someone being in its path, regardless of how unexpected, may be present. The hazard potential classification system categorizes dams based on the impacts to existing downstream development. The system does not consider the occasional passer-by, recreationist, or non-overnight outdoor use of downstream lands when evaluating potential adverse incremental consequences. Further, no allowances for evacuation or other emergency actions by the populous should be considered.

4. Consultant's Safety Inspection Reports. The date of the last consultant's inspection and report should be given. The first Operation Report following the consultant's inspection should list the recommendations made by the consultant and comment specifically on

compliance with each recommendation. Subsequent reports will comment only on uncompleted actions. If the first consultant's report has yet to be made, the due date should be given. If a consultant's report is not required, so state.

5. Licensee's Inspection Program. The report should indicate whether the licensee has adopted a periodic program for inspection of the project and the adequacy of such inspections. The report should describe the program indicating the purpose of inspection, type frequency of inspections, and personnel performing inspection. If the inspection program consists of periodic inspections of the project by operating personnel, it should be so stated. Sufficient details of the inspection program shall be given to adequately describe the scope and intent of the inspection.

B. Operation and Maintenance.

Report any important maintenance work performed on the project structures, machinery and equipment since the last inspection and cite the methods employed in performing this work. Indicate whether the licensee has adopted a periodic maintenance and inspection program for the purposes of making necessary repairs, renewals, and replacements. Advise whether the licensee has scheduled or performed the work required to correct operation and maintenance deficiencies previously detected and request by follow-up letter from the Regional Director. Submit full information on serious deficiencies in maintenance of the project and advise as to what measures, if any, the licensee proposes to take to correct the deficiencies.

1. Dams, Dikes and Appurtenant Structures. Report on maintenance performance during the report period that is not directly related to structural safety matters. For embankment structures, maintenance items to be reported on would include roadways, control of vegetation (mowing of grass, removal of trees and brush, and clearing of abutments and toes, etc.), erosion control, drainage control, and slope protection. For concrete structures, maintenance items to be reported on would include repair of concrete surfaces; cleaning foundation drains; access galleries, and drainage systems; repair of lighting systems; and repairs to walkways, ladders, steps, handrails, trash racks, and intake gates, stoplogs and bulkheads, and associated mechanical and electrical equipment. Comments may be made on the condition of those features which are primarily a maintenance problem at the time of the inspection, but if left unattended, could become a dam safety problem. Include here observations of operation and maintenance of features not discussed elsewhere, such as tunnels, surge tanks pipelines, canals, flumes, etc. Indicate whether the condition of such features have become impaired due to erosion, seepage, deterioration, settlement or other causes. Discuss need for remedial measures.

2. Spillway Gates and Standby Power. It is important to note the spillway gates and the operating machinery are in good condition. All spillway gates must be operated to a lift of several inches at least annually and to full design height at least once every five years. It is preferred that the gate operation be witnessed by the inspecting engineer; however, if this poses a problem for the licensee, a certificate that all gates have been operated within the past year

verified in accordance with Section 12.13 of the Regulations may be accepted. It should be verified during the inspection that operating personnel know where keys, handcranks, handwheels, etc., are kept. The report should comment on gate operation. Availability of stoplogs or other emergency closures for the maintenance of spillway gates, tunnels, or penstock intake gates, and draft tubes will be determined.

In every plant except where full hand operation of valves and spillway gates are possible, a standby or alternate source of power for gate and valve operation shall be available. The report should state the type of standby power or emergency power source.

3. Power Plants. Report the extent of water being wasted for any of the following reasons: voluntary, inefficient management, excessive leakage of gates or conduits, poor condition of the hydraulic machinery, and other controllable causes. It is not necessary to report water that is wasted due to uncontrollable causes. Any methods or suggestion for increasing efficiency and preventing or reducing waste of water should be included in the report.

Submit full information on any important unscheduled shutdowns and suspensions of operation. Specify the period or periods during which they occurred and the reasons for such shutdowns and suspensions.

A determination should be made if the installed capacity (nameplate rating on the generator) differs from the capacity stated in the license or exemption.

4. Reservoir. Submit full information as to whether the project reservoir is being maintained and operated in accordance with the provisions of the license. For those projects where the license requires the operation of the reservoir within certain prescribed limits, the report should include a statement on licensee's compliance with the prescribed maximum and minimum monthly reservoir elevations for the period covered in the report. State specifically whether or not there is a rule curve for the project reservoir. Also include details such as whether or not it has been provided to the Commission and approved by the Commission. Report on other matters such as flood control, fish and wildlife, water quality, vector control, algae blooms, clearing, damages to property contiguous to the reservoir, recreational use of project waters and lands, and acquisition of additional lands for flowage purposes, except where covered by a special article. The inspecting engineer should note whether the face of the dam and the shores of the reservoir are being kept free of floatable debris and dead trees which give the project an unsightly appearance and may result in damaging the project works during periods of high water or may seriously interfere with the operation of the project, particularly the spillway. Where conditions warrant, the reservoir shoreline should be observed for any evidence of instability or displacement indicative of potential slides which although not related to dam safety might cause property damage, loss of life, or impairment of recreational resources.

5. Records. Section 12.12 of the Regulations requires the applicant or licensee to maintain permanent project records at a central location, such as the project site or the

main business office. The kinds of records are described in Section 12.12(a)(i) of the Regulations. If the originals of the permanent project records are maintained at a central location other than the project site, the applicant or licensee must maintain at the project site copies of at least the project Exhibit F or L (design drawings), instrumentation data and operational history that are necessary to the safe and efficient operation of the project. Exemptees should be encouraged to maintain similar records at the project site. During an inspection of the project, the existence of the records shall be ascertained and subsequently reported on.

6. Emergency Action Plans. The report should contain the inspecting engineer's assessment and verification that the licensee is in compliance with the requirements of the emergency action plan. If an emergency action plan is not required, the reasons for not submitting a plan should be discussed in this section of the report. For those projects where an exemption from filing an emergency action plan has been granted, the report should contain the inspecting engineer's verification that the licensee is in compliance with the conditions of the exemption and include the inspecting engineer's recommendation for the continuation or revocation of the exemption. Emergency notification procedures and other possible actions to minimize the downstream effect of a possible failure of the structure should be available in each powerhouse or other location and be readily accessible to the operator of the project. The inspection report should note whether plans were readily available and understood by key operating personnel on duty at the time of the inspection. The report should indicate when the last annual test was performed and note the status of training and readiness of operating personnel. At unmanned dams, dams with long embankments and developments with detached structures the report should contain an assessment of the need for adequate surveillance to ensure the timely implementation of the emergency action plan, if failure should occur. Where a warning system exists, photographs illustrating the basic elements of the system should be included in the report. If it is believed that the plan can be improved, the matter should be discussed with the licensee's representatives. Discussions should subsequently be confirmed by a letter and schedule of the proposed plan of action to be taken by a certain date. The inspection report should document the discussion and state that follow-up has been, or will be made on the matter.

C. Environmental, Public Use and Safety.

Section 12.42 of the Regulations requires installation, operation, and maintenance of public safety devices to the satisfaction of the Regional Director. The authority to require plans, such as the Public Safety Plan, is included in Section 12.4 of FERC's Regulations.

1. Public Safety Plan (Plan). To assist in our review of the adequacy of public safety measures at licensed and exempted projects, a Plan is required for each project where public safety measures are necessary. The plan need not be overly complex. The plan should simply include a list of each safety device at the project and a schematic drawing showing the general location of each device. A sample drawing is shown in Figure 1 of the Public Safety Guidelines. All safety devices, such as fences, signs, boat barriers, buoys, log booms, audible devices, night illuminations, and beacon lights should be listed and shown on the drawing. Other data and descriptions that would be helpful include the approximate height and type of fences, the type of boat restraining barriers, the approximate distance of the barriers from the spillway, the wording on the signs, and the type and schedules for audible warning devices. A sample letter requesting the Public Safety Plan is shown in Appendix 4 of the Public Safety Guidelines. Two copies of the Plan must be submitted by the licensee/exemptee. Upon submission of the Public Safety Plan, the Regional Office should review the plan to determine if it appears adequate. Installation, operation and maintenance of all public safety devices will be reviewed during each inspection and compared to the Public Safety Plan. Any comments should be addressed to the licensee/exemptee in the field and included in the follow-up letter. The Public Safety Plan is necessary to show the installation of warning and safety devices required by Section 12.

The installation of devices to protect the public safety at licensed and exempted projects is an important element of the Part 12 Regulations. Existing installations should be reviewed during each inspection. Improvements or additions must be required at any project where there is a need to increase the level of protection. Inspectors should verbally point out to owners where improvements or additions can be made, and should follow-up with a requirement to do so in a letter from the Regional Director. The letter should remind the licensee to revise the Public Safety Plan to include these additions or improvements. In addition, if you are aware of any booms or other devices that are removed during the winter or have been removed for maintenance, a reminder during the inspection and letter to the owner requiring restoration immediately or prior to the recreational season is needed. All free-flow spillways should have some type of warning or protective devices and other facilities (gated spillways, powerhouses, etc.) should have adequate protective devices as dictated by the physical circumstances at each project. During inspections of projects, you should note any danger to the public from operation of a project, re-evaluate existing safety installations, and include in the report of the inspection a discussion of their adequacy. These matters should be addressed to the licensee in the field. If follow-up letters are required, they must be expedited.

2. Need for Action. Report on the need for action by the licensee to protect life and property, such as installation of: safety barriers to help keep people and boats away from

spillways or other danger areas; fencing to discourage public entry to hazardous areas; warning signs, signals and audible alarms to denote sudden changes in water releases below the powerhouse and spillway; provisions to keep snowmobilers and ice fishermen from thin ice areas near project structures; and signs and buoys to warn sail boaters away from low bridges and transmission and communication lines and swimmers from dangerous areas. The report should also indicate the level of maintenance of environmental and public use and safety facilities. Appendix 9, titled "Guidelines for Public Safety at Hydropower Projects" should be referred to in determining existing or potential public safety hazards and in recommending prevention measures that licensee/exemptees should take to reduce or eliminate any such hazards. It is imperative that each inspecting staff member be familiar with the Public Safety Guidelines and its goals and objectives.

3. Environmental and Public Use Inspection. Environmental and public use aspects should be inspected in accordance with guidelines contained in Chapter VI.

D. Matters of Commission Interest.

1. Additions, Betterments, Leases, Retirements, or Needed Extensions.

Report any important extensions to or changes in the project, important replacements or betterments, or unusual repairs that have been made during the inspection period. Examples to be reported are the relocation or replacement of a conduit or transmission line, any major project works, installation of additional generating units or the elimination of or replacement of any generating unit, retirement of a project road, and renewals and replacement of electrical equipment in the powerhouse and substation. Include recommendations as to whether such matters should be the subject of an application for amendment of license.

Report whether any changes have been made outside the project boundary, as defined by the Exhibit G or K, which the licensee proposes to treat as non-project property but which, in the opinion of the inspecting engineer, should be brought under the license. Report on any transfer by the licensee of its rights in project works under license without prior approval by the Commission.

To the extent possible, the inspecting engineer should report on the lease of any project property which might require Commission approval and on any unauthorized uses of project lands and waters by others.

2. Requiring Commission Action. Advise whether there are any matters such as new construction; abandonment or modification of project works; acquisition or abandonment of lands; lease of project lands; non-project use of project property; programs for conservation and use of recreation and fish and wildlife resources; or contracts or agreements for the sale of power developed by the project which would require amendment of license, approval, or other action by the Commission.



3. Project Compliance. The inspecting engineer should note whether the licensee is complying with the requirements of the license insofar as his observations can verify. The inspecting engineer should be familiar with the special conditions of the license. For example, the license may require: the release of a continuous flow for the purposes specified in the license; special studies of various types, the installation of additional facilities including recreational and fish and wildlife facilities, additional construction, or modifications to be completed within a specified time; additional surveys to show more adequately the project boundary; etc.

The inspection report should note all instances of non-compliance during the reporting period with any outstanding article, Commission regulation, or other order paragraph conditions requiring compliance. Report on any actions by the licensee to ensure compliance. If determined by field investigations and office studies that full compliance has been effected, this should be reported. In cases where there are instances of non-compliance, list the article, regulation, or ordering paragraph and briefly explain the nature and status of the non-compliance activity. The reasons for non-compliance should also be discussed with the licensee in the field. Follow-up letters on non-compliance or referrals pursuant to Chapter VIII should be expedited to ensure compliance.

E. Findings and Follow-up Action.

All dam safety and operation and maintenance findings discussed within the Operation Inspection Report shall be listed separately in this section of the report under the appropriate heading. The finding listed shall be written in concise terms with reference to any details discussed in the report. Follow-up actions taken concerning each finding shall be included with reference to necessary follow-up correspondence made to the licensee. The effectiveness of the Licensees follow-up actions should be discussed in the next Operation Report.

3-3 Conditions Affecting the Safety of a Project or Its Works. An applicant or licensee must report to the Regional Director any conditions affecting the safety of a project or project works, as defined in Section 12.3(b) (4) of the Regulations. The report should be in accordance to Section 12.10(a) of the Regulations. Appendix 10 outlines the procedures to be followed by the Division of Dam Safety and Inspections in the event that more than one dam safety emergency occurs during the same time period.

3-4 Unusual Natural Events or Weather Conditions. The licensee/exemptee should initiate an inspection of their facilities whenever earthquake damage is suspected. The licensee/exemptee is required to verbally notify the Regional Engineer of any unusual conditions discovered during their post-earthquake inspection. Following the oral report of the safety related incident the licensee/exemptee is required to submit a written report to the Regional Engineer which documents the results of the inspection and further actions identified to be taken, as also defined in Part 12.10 of 18 CFR, Chapter 1.

In general, licensees/exemptees will be requested to inspect project facilities and report conditions after seismic events of magnitude 5 (Richter) and above within an epicentral distance of 12 miles of the dam, or an earthquake of magnitude 4 or greater with an epicenter within 5 miles of the dam.

Regional Directors will submit to the Director, D2SI special reports describing any unusual weather events, exceptional storms, floods, extended periods of above or below average rainfall over an important power producing area, or water content of snowpack varying appreciably from average.

In the event of project flooding, regional office staff will inspect the project as soon as reasonably possible. Within 3 days of the event, the Regional Director will request, from the licensee, a report on the flood event and the damages sustained by the project. The report should include, but not be limited to the following, a detailed report containing a description of the flood event, headwater elevations, gage information, sequence and timing of gate/reservoir operations, spillway rating curve, operational restraints, tailwater deviations, status of emergency action plan, graphical representations of inflows, project outflows, inflow hydrographs, and other related hydrological information as appropriate. In addition, all license article requirements related to flood control, reservoir operations or downstream restrictions must be identified.

The Regional Director will coordinate the review of the report with the Washington Office and provide the licensee with comments when it appears that the project did not adhere to the terms and conditions of the license during the flood event.

## CHAPTER IV

### INDEPENDENT CONSULTANT'S SAFETY INSPECTIONS AND REPORTS

4-1 Projects Requiring Consultant's Inspection. The provisions of this section apply to any development of a project licensed under Part I of the Federal Power Act having a dam exceeding 32.8 feet (10 meters) in height above stream bed or having a reservoir with a gross storage capacity in excess of 2,000 acre-feet (2.5 million cubic meters). They also apply to any other dam having a high hazard potential, as determined by the Regional Director or other authorized Commission representative. The Regional Director's determination will be made on a case-by-case basis after considering the performance record and the operational and maintenance history of the project. The hazard potential of dams should be determined in accordance with the discussion in Chapter I, Section 1-2, of the FERC Engineering Guidelines.

For the purpose of this section, the height of the dam is the vertical distance from the lowest elevation of the natural streambed at the downstream toe to the maximum water storage elevation under conditions of zero spillway discharge. Thus, for gated spillways the maximum possible storage level would be the elevation of the top of the gates, and for ungated spillways the maximum possible storage level would be the elevation of the spillway crest or top of flashboards. For projects without spillways, the height should be measured as the vertical distance from the lowest point of natural streambed at the downstream toe to the lowest point on the crest of the embankment. Gross storage capacity is the maximum possible water volume impounded at zero spill.

4-2 Significant Hazard Potential Dams. A substantial number of the licensed dams are not required by the Part 12D dam safety regulations to be inspected by independent consultants. In addition, future licenses/exemptions may include significant hazard potential dams in this category. To achieve a better assessment of these significant hazard potential dams the Regional Director will request each licensee/exemptee whose project includes a significant hazard potential dam for which a Part 12D inspection is not required to prepare basic stability and hydraulic evaluations and analyses of each project structure. The evaluations and analyses may be completed by the licensee/exemptee if it has the appropriate engineering experience and analytical capabilities to accomplish this work.

The purpose of these evaluations is to ensure that significant hazard potential structures meet or exceed a minimum safety standard for a significant hazard potential structure in accordance with the FERC Engineering Guidelines. The licensee/exemptee should conduct analyses for the usual (normal), unusual (flood flows and ice) and extreme (seismic) loading conditions as defined in the Engineering Guidelines using supportable and documented assumptions based on site specific experience, or existing project data, and the structural characteristics and conditions of the existing facilities.

The report from the licensee/exemptee covering the analyses and evaluations may be submitted in a letter report format and include:

- Description of structures
- Current conditions of structures
- Analyses and evaluations
- Supporting Computations (including appropriate cross-section and loading diagrams)
- Normal maintenance performed on structures
- Photographs of structures

Staff will review the reports submitted by the licensee/ exemptee and prepare a letter to the licensee/exemptee with the results of the review. The review process and procedures will follow those performed in reviewing Part 12D Independent Consultant Inspection Reports discussed below.

Any new projects that include structures classified as significant hazard potential that do not require a Part 12D Independent Consultant Inspection should be treated as discussed above. A copy of a letter to be sent to the licensee/exemptee concerning these significant hazard potential dams is included in Appendix 11.

4-3 General Inspection Requirement. Notwithstanding any other terms and conditions of the license, the licensee must retain a qualified independent consultant to conduct a complete inspection of the project works, excluding transmission lines and generating equipment, within the time period prescribed in the Commission's Regulations to determine whether there are any current or potential deficiencies in the condition of project structures, quality and adequacy of maintenance, or methods of operation, which might endanger public safety.

An independent consultant is defined in Section 12.32(3) of the Regulations. At least 60 days before the initiation of an inspection, the licensee must submit to the Director, D2SI for approval, with a copy to the Regional Director, a detailed resume of the independent consultant.

4-4 Scope of Inspection. The inspection by the independent consultant shall be in accordance with Section 12.35 of the Regulations and cover the subject matter outlined in Appendix 3.

It is particularly important for the consultant to include a complete evaluation of each dam, both from an analytical and a physical inspection point of view. Each dam must be analyzed in accordance with Commission's Engineering Guidelines for all loading conditions. Special attention should be given to seismic loading, including liquefaction potential for embankment dams, particularly in high seismic areas, and to extreme hydrologic events.

If, in the course of an inspection, an independent consultant discovers any condition for which emergency corrective measures are advisable, the independent consultant must immediately notify the licensee and the licensee must immediately report that condition to the Regional Director.

4-5 Report of the Independent Consultant. The report of the independent consultant must comply with Section 12.37 of the Regulations and should be prepared in accordance with the Outline For Independent Consultants Inspection Reports (Appendix 3).

The report prepared after the completion of any dam safety remedial measures which are constructed after the completion of an approved Part 12 Inspection Report will generally cover operation and maintenance of the facility and a review to determine whether project conditions or assumptions made in previous analyses have changed. The review should include a summary of the dam safety modifications made to the project structures that have occurred since the previous Part 12 Inspection Report. Therefore, plans, elevations, and sections of the principle project works, as modified, must be updated in the current report. A summary of the design assumptions (e.g. loading conditions [including the Inflow Design Flood (IDF)]), strength parameters, uplift, etc.) and factors of safety should be included. In addition, changes in downstream development should be stated with a determination as to whether any new development impacts the IDF. Any changed conditions should be reported including an explanation as to whether any such conditions affect the performance or stability of the structures. This would be based on a review of any monitoring information and any changes in physical condition noted during the inspection by the independent consultant. If changes in conditions are indicated, stability analyses should be appropriately revised. In conjunction with this, the independent consultant should analyze the adequacy of existing monitoring instruments, periodic observation programs, and other methods of monitoring project works and conditions affecting the safety of the project or project works.

4-6 Time for Inspections and Reports. The time for inspections and reports shall be in accordance with Section 12.38 of the Regulations. Approximately a year in advance of the due date, a letter will be sent to the licensee as a reminder of the requirement for the consultant's inspection. The licensee should be advised that the physical inspections of projects should be made at a time when all significant project works can be examined. For good cause shown, the Regional Director may extend the time for filing a report. Extensions of time for preparation of Part 12 Reports and Supplements for projects that are involved in relicensing are more sensitive and must be considered in light of relicensing process time frames.

4-7 Exemption from Filing an Independent Consultant's Report. In order to receive an exemption from filing an Independent Consultant's report (Part 12, Subpart D), the licensee must show good cause for the exemption. The licensee must file a written request for an exemption with the Director, Office of Hydropower Licensing. The request must include a report that fully documents all reconnaissance and studies performed to satisfactorily demonstrate that failure of any structure would not present a hazard to human life or cause significant property damage under all flow conditions up to the probable maximum flood or inflow design flood (IDF).

If the results of reconnaissance of the areas downstream of the dam are inconclusive in determining the hazard potential of the dam, a dam break analysis should be performed and results of the analysis furnished in the report. The dam break analysis should consider failure under normal operating conditions and flood flows (including IDF) up to the point where no significant

increase in hazard to downstream life and property occurs as a result of failure. An inundation map and, if necessary, water surface profiles, should be developed and furnished for the flow condition that results in the greatest potential for loss of life and significant property damage, i.e. the worst case flood condition analyzed. The method and assumptions utilized in the dam break analysis should be fully documented. The inundation map and water surface profiles should delineate the affected areas and water surface elevations prior to and after the assumed failure. Since downstream conditions can change in the future, all exemptions from Part 12, Subpart D requirements must be reviewed prior to each operation inspection by the Regional Director to verify that the justification for exemption is still valid for failure under normal and flood flow conditions up to the PMF or IDF.

Approval of a request for exemption from filing an independent consultant's report is delegated to the Director, D2SI. All approval or rejection letters and requests for additional information must be sent under the signature of the Director, D2SI. The Regional Director responds to each Subpart D exemption request. In those cases where the licensee requests an exemption from both Subparts C and D of Part 12, the correspondence must also be signed by the Director, D2SI.

4-8 Licensee's Comments on Consultant's Recommendations. Within 60 days following the submission of the consultant's report, the licensee shall file with the Regional Director a plan of action and schedule for compliance with recommendations of the consultant. The recommendations for design and implementation of corrective measures may also include the need for further investigation. In those cases where the licensee has proposed remedial measures different from those made by the consultant, or no remedial action at all, adequate justification must be provided by the licensee. The Regional Director should acknowledge receipt. An extension of time may be granted by the Regional Director for the licensee to submit its plan of action where justified. In the Regional Office's acknowledgment letter, the Licensee/Exemptee should be notified that project modifications require prior approval. Modifications include but are not limited to, stabilization of project works, changes to authorized operating procedures, installation of additional instrumentation or removal of existing instrumentation, undertaking a field investigation program or altering the configuration of authorized project works.

4-9 Review of Consultant's Report. The report is to be filed with the appropriate Regional Director. Upon receipt of the report, the Regional Director will make an initial review for scope of coverage. The purpose of the initial review is to ensure that the requirements of the regulations have been met. If the report does not include the essential elements as described in Section 12.37 of the Regulations or, if applicable, the outline for Part 12 reports (Appendix 3), the licensee shall be advised how the report should be revised. Patently deficient reports should be rejected and a new due date established. The new due date should be at least 3 months but no more than 6 months from the date of the letter rejecting the report.

Also, upon receipt of the report a preliminary technical review should be made. The preliminary technical review should entail a cursory review of the inspection report to determine if

the consultant reported any immediate dam safety concerns. The regional office Director should review the consultant's conclusions and recommendations as well as the major assumptions used in the analysis and note any apparent significant dam safety issues that will require immediate action including, but not limited to, inadequate safety factors; urgent consultant recommendations for remedial improvements or further studies; incorrect assumptions in the analyses (the correction of which would affect the consultant's conclusions); or a potentially serious field condition that was reported but not pursued by the consultant. In the event a significant dam safety condition is detected at the preliminary technical review state, the Regional Office should contact the Washington Office by telephone and coordinate a "fast-track" review of the report. In addition to the Regional Office preliminary technical review, upon receipt of reports from the Regional Offices, the Washington Office staff will also conduct a cursory review of the reports to identify any projects that would require a "fast-track" review.

If the report apparently provides adequate coverage, and does not identify any critical dam safety issues, the Regional Director will proceed with a detailed technical review and evaluation of the report. In reviewing the consultant's assessment of project hydrology and project hydraulics, structural stability and adequacy of the dams and their appurtenant structures, the Regional Director should examine the consultant's investigations and evaluations to determine if they are consistent with FERC design criteria.

The information required to evaluate the adequacy of the consultant's analysis should be furnished in accordance with Section 12.37 of the Regulations. The criteria used by the consultant should be consistent with any changed conditions discovered during the onsite examination such as loadings, flows, increased uplift pressures in the dam or its foundation, etc. The data presented in the consultant's reports should be reviewed to determine if they are correct and if the latest information has been considered. The methods and procedures used by the consultant in his evaluation of the structure should be consistent with the latest state-of-the-art methods and criteria and, where applicable, in accordance with the engineering criteria contained in the FERC "Engineering Guidelines for the Evaluation of Hydropower Projects."

For existing structures where a reasonable determination of the PMP has previously been made, a PMF has been properly determined, and the project structures can withstand the loading or overtopping imposed by a PMF, a re-evaluation of the adequacy of the spillway using updated Hydrometeorological Reports such as Number 51 and 52 in areas east of the 105th meridian, is not required. A sample letter is included in Appendix 6.

Licensees on occasion propose to refine Probable Maximum Precipitation (PMP) estimates in National Weather Service (NWS) Hydrometeorological Reports by conducting site specific or regional studies. Any licensee desiring to conduct a site specific or regional probable maximum precipitation (PMP) analysis must obtain the services of a qualified hydrometeorologist and retain a Board of Qualified Independent Consultants (BOC) that includes representation from the Hydrometeorological Division of the NWS. Both the hydrometeorologist and the BOC must be approved by the Director, D2SI. The hydrometeorologist must demonstrate experience in

determining PMPs. The BOC is expected to review and assess each phase of the site specific or regional PMP study and provide direction to the hydrometeorologist, as necessary, to ensure the study methodology remains compatible with PMP theory and procedures.

The BOC should consist of three or more qualified, independent, consultants, to include, as a minimum, an experienced hydrometeorologist from the NWS, a meteorologist, and hydrologist. The names and qualifications of the BOC members should be submitted to the Director, D2SI, for approval, with a copy to the Regional Director. Among other things, the BOC shall assess the hydrology and meteorology of the project site and conduct review of each phase of the analyses prepared by the licensee's hydrometeorologist. The BOC will provide oversight, direction, and guidance during each phase of the analysis, verifying that meteorologic compatibility with PMP theory is maintained; and ensure that all assumptions, methodology, and decisions are adequately justified.

During formal meetings with the licensee and its consultant to discuss progress towards the development of the PMP, the BOC reviews the meteorologic decisions and assumptions used in the analysis and subsequent application to the hydrologic runoff process. The licensee will be requested to submit an agenda and copies of information needed to be reviewed prior to the BOC meeting to each BOC member and to the Regional Office prior to the meeting. Within 30 days after each BOC meeting, the licensee shall submit to the Regional Office copies of the BOC's report and a statement of intent to comply with the BOC's report and a statement identifying a plan to resolve the issue(s). In the event of non compliance, provide detailed reasons for not doing so. The licensee should submit to the regional office three copies of the final report prepared by the contracting hydrometeorologist and furnish comments through the licensee to the regional office. The Regional Office will submit two copies of the final report and the BOC comments to the Washington Office for review. A memorandum and draft letter accepting the final report or providing comments should be sent to the Director-D2SI within 60 days.

All new PMF studies are to comply with the requirements of the new guidelines.

Comments on the consultant's safety report should include any deficiencies noted in the scope or conduct of the inspection and may include appropriate suggestions for improvement both in the inspection and in preparation of the report. Should questions arise as to the findings and conclusions of the consultant or in recommended remedial action, it may be necessary to require additional explanations or interpretations and, in some cases, further investigations, studies, analyses, and reports. Required supplemental information necessary to reach a conclusion concerning the adequacy of the project works or need for remedial repair must be provided either by the approved independent consultant, or, if necessary, by the licensee or another consultant, providing the work is reviewed and approved by the approved independent consultant. If the consultant's report or inspection by the Commission's staff reveals conditions that affect the safety of the project structures, additional inspection and investigation may also be required.



In general, the following additional investigations and studies should be requested whenever it is indicated that a high or significant hazard potential structure may fail under any flow conditions up to the Probable Maximum Flood (PMF).

- a. A dambreak analysis under normal and various flood flow conditions to make sure that the full extent of the area subjected to hazards is identified. The IDF should be determined by analyzing flood flows, up to a level where there is no significant increase in hazard to life or property due to a project failure under that condition. This may include flows up to the PMF condition. Special cases where dam failure could cause domino-like failure of downstream dams resulting in a cumulative flood wave large enough to cause a threat should also be considered. (See Engineering Guidelines, page 2-5 and 2-6 of Chapter II and page 6-4 of Chapter VI.) This information should be used in the preparation of an inundation map for the IDF condition indicating affected areas prior to and after assumed failure. If failure would not result in loss of life or incremental damages, no further work would be required.
- b. Analyses of hydrologic factors and hydraulic capabilities and structural stability to identify project deficiencies resulting from IDF flows.
- c. Determination of the remedial measures required to safely withstand or pass IDF flood flows based on results of appropriate engineering and design studies.

Appendix 7 provides the detailed procedure to be used to select the appropriate inflow design flood for a project and determining the need for remedial measures.

4-10 Dam Safety Repairs and Modifications Required as a Result of Part 12. After the evaluation of the consultants report and analysis, the Regional Director may find it necessary to direct the licensee to implement remedial measures. Remedial action proposed by the licensee should be carefully reviewed as to adequacy and timeliness and, if additional measures appear necessary, the licensee shall be directed to take appropriate action.

When the nature of the remedial works consists of minor modifications which will not make a change in the physical features of the project, and requires the preparation of plans and specification to adequately carry out the remedial work, the licensee will be specifically requested to furnish the Regional Director, for review, three copies of the plans and specifications of the remedial work at least 60 days prior to initiation of construction in accordance with Article 3 of the Standard L Forms for licensed projects. When the nature of the remedial work consists of major modifications which will make substantial alterations or additions to project features (e.g. raising the height of dam and spillway additions that would modify project structures as shown on approved exhibit drawings) the licensee should be advised that an application for Amendment of License is required to be submitted to the Director, OHL in accordance with Subpart L, part 4 of the Commission's Regulations. Before so advising licensees, however, the Regional Director

should consider whether major modifications could be approved through review of plans and specifications and that it may be more appropriate and expedient to only submit as built exhibit drawings for approval. Changes that could be covered by this approach include post-tensioning, gate modifications, replacement of structures in kind, and other similar modifications.

4-11 Instrumentation. With the resolution of any dam safety matters and any resulting remedial measures, projects are concluded to meet current safety criteria. The next phase of review will be to monitor the performance of the structures (including changes in structural loading conditions and other physical project conditions) and to monitor licensee/exemptee compliance. This will include identifying key monitoring requirements to ensure the proper maintenance and safety performance of project structures.

During both the performance of operation inspections and during the review of future Part 12 inspection reports, project structures must be reviewed to determine if any additional monitoring instrumentation is required in order to ascertain the current project facility conditions and to ensure the continued safety operation of the projects. Each project will be reviewed based on site specific conditions. Some projects may have adequate instrumentation, whereas others may require additional or new instrumentation. Basically, the physical conditions must be established to determine if assumptions made in evaluation are valid.

There are no generic instrumentation requirements for all projects. Each structure will have site specific characteristics that must be evaluated through appropriate monitoring devices. It is important that any instrumentation required will monitor those performance elements that are essential to evaluating a dam for structural safety and observed site conditions that may be recommended for nearly all dams, while others may be recommended only in special cases. Any probable structural problems, known anomalies in geologic foundation conditions or the structures themselves, seepage conditions, etc. are factors that justify installing and monitoring instrumentation.

There are various types of instrumentation that may be required for embankment dams. These include instrumentation to monitor quantity and source of seepage, differential and total earth movements, water levels, pore pressures, and water quality. Factors or quantities that should be monitored in concrete dams include structural displacements, deformation, settlement, seepage, piezometric levels in dam foundations, and uplift levels within the structure or foundations.

The following includes examples of different types of monitoring. These will not apply to all dams, but are presented as a check list for instrumentation that should either be in place or under consideration, as appropriate.

#### Monitoring Requirements

Dam Safety ConditionsMonitoring Methods

Scour	Soundings, probing divers, inspection visual survey
Sedimentation	Soundings, probing, divers, inspections visual survey
Uplift/pore pressure	Piezometer, observation wells
Leakage	Observation, weirs, gages
Movement/settlement	Control surveys, inclinometers, extensometers, settlement platform, strain gages
Crack/joint change	Reference points, gages
Spillway gate operability	Visual survey, test
Boils/piping	Visual survey, flow gage, deposition rate measurement
Deterioration	Visual and photographic survey
Functioning of drains	Visual inspection, testing flow measurements
Penstock/Tunnel deterioration	Visual, tests

4-12 Release of Consultant's Report. The consultant's report and all correspondence with the licensee regarding the inspection reports are a part of the public files of the Commission. The reports and correspondence may be reviewed by the public but requests for copies should be referred to the Office of External Affairs or the licensee.

## CHAPTER V

### EMERGENCY ACTION PLANS

5-1 Purpose. The primary purpose of an emergency action plan (EAP) is to provide operating and mobilization and notification procedures to be followed in case of an emergency. An emergency is defined as an impending or actual sudden release of water at the project caused by natural disaster, accident, or failure of project works. The emergency action plan can be used to provide a useful public service by informing downstream entities of an impending flood condition when the dam is not in danger of failing and large spillway releases are expected.

5-2 Requirement. Each licensee/exemptee/applicant for license (herein referred to as licensee) for a constructed project is required to prepare an EAP.

The EAP should be designed to, among other things, provide an early warning to upstream and downstream inhabitants, property owners, recreation users, and other persons in the vicinity of the project or dam potentially endangered in case of an emergency in accordance with Sections 12.22 and 12.24 of the regulations and guidelines (See Appendix 4) approved by the Director, OHL. Notification procedures for such parties should be established and coordinated with appropriate agencies responsible for disasters or emergencies, community officials, and park or recreation facility operators.

The EAP should be submitted to the Regional Director within the time limits prescribed by Section 12.23 of the regulations and should comply with the format and criteria as outlined in the guidelines issued February 22, 1988, and its addendum issued September 9, 1988 (see Appendix 4), and Section 12.22 of the regulations, along with a summary of the study used. The Regional Director may exempt the project or development thereof from the requirement to file the EAP if the licensee submits a justification showing that failure of the dam would not endanger life or cause property damage. A licensee may not be exempted from the requirements of Section 12.22(c) of the regulations or the guidelines for a radiological emergency response plan.

When a licensed project is located at a Federal dam, the licensee is required to cooperate with the appropriate Federal agency in any emergency action planning which would provide procedures to be followed in the case of an accident to or failure of water retaining structures or other structures licensed by the Commission that may affect the integrity and/or operation of the Federal project. Therefore, the licensee should be required to prepare a documented procedure for notifying the appropriate representatives of the Federal agency of an emergency and should ensure that the operating personnel are familiar with these procedures. Also, the procedure should indicate that the licensee is aware of and prepared to enact its responsibilities under any EAP formulated by the Federal agency for that government facility. Three copies of the procedure for notifying the Federal agency of an emergency should be submitted to the Regional Director. In addition, the Regional Director should be furnished copies of correspondence with the Federal agency as well as a written statement, verified in accordance with Section 12.13 of the Commission's Regulations, indicating that the licensee will cooperate in the implementation of that

Federal agency's EAP and that it has instructed its operating personnel on how to respond to an emergency under the Federal agency's plan.

5-3 Submission and Evaluation for Adequacy. Three copies of the EAP and any other supplementary information will be verified in accordance with Section 12.13 of the regulations and submitted to the Regional Director. Receipt of an EAP should be acknowledged by the Regional Director. The Regional Director will subject the EAP to critical review to ascertain compliance with the elements required. To facilitate development, review, and updating of EAPs, the Regional Directors should provide all owners with a copy of the guidelines in Appendix 4 which establish a specific format. In accordance with the guidelines, all EAPs, except those at government dams, shall conform with the format and criteria established in the guidelines. In order to ensure every EAP currently on file with the Regional Director complies with the established format, every EAP filed prior to February 15, 1988, must be revised, as necessary, to conform with the format and then be completely reprinted and redistributed to all participants with three copies resubmitted to the Regional Director no later than December 31, 1988. Subsequently, a completed reprinted copy of the most up-to-date EAP must be redistributed to all participants, including the Regional Director on a five year cycle (as a maximum), commencing with December 31, 1993. During the intervening years, annual updates (which are to be submitted by December 31st of each year may be made by issuing to all plan holders only those pages than contain updated information. Nevertheless, more frequent total reprintings of the EAP as the annual update are acceptable and commendable.

The EAP should include means for keeping local authorities advised of conditions at the dam. The Commission does not intend for licensees to usurp the responsibility of governmental elements for evacuation of people. However, if there is a situation where routine notification will not suffice, such as a resident located just below the dam, the licensee should arrange to notify that person directly. This should be coordinated with the pertinent public officials and should be discussed in the EAP.

Dam break analyses, including input assumptions and output results, submitted by the dam owner should be reviewed by the Regional Office for acceptability. Chapter VI of the Engineering Guidelines discusses the requirements for dambreak analyses for an EAP.

The results of the dambreak study, which appear on the inundation map, should indicate the potential hazard to downstream life and property. Therefore, the inundation map must be reviewed in conjunction with the study when determining acceptability. The most important consideration is whether the information on the inundation map is up-to-date and adequate for the development of a workable EAP. A workable EAP should provide procedures for issuing early notification of a dam emergency so that warning and evacuation of persons who would be endangered by a dam failure may proceed in as prompt a manner as possible.

Inundation maps should be required for all high and significant hazard developments unless an unusual condition exists (e.g. the only area where life and property would be affected

by a failure is located immediately downstream of the dam where either warning time is limited or other conditions exist).

The licensee should perform a dambreak analysis, to develop an inundation map, and to provide a summary of all criteria and assumptions used in the study. The method selected for the study must be identified and briefly described. Justification must be provided for all assumptions used in the study (i.e. normal or flood flow condition, breach width, time to failure, etc.).

Inundation maps must conform to the requirements for mapping established in Chapter VI of the Engineering Guidelines.

5-4 Exemption from Filing an Emergency Action Plan. All licensees must file an EAP unless they have specifically filed for and been granted an exemption from that requirement. In order to receive an exemption from filing an EAP, the licensee must demonstrate that no reasonably foreseeable project emergency would endanger life, health or property. To satisfactorily demonstrate the consequences of a failure, the licensee will have to submit a report that fully documents all reconnaissance and studies performed to determine that failure of the dam will not present a hazard to human life or cause significant property damage under all flow and conditions up to the probable maximum flood (PMF). See Chapter VI of the Engineering Guidelines for a detailed discussion.

If the results of reconnaissance of the areas downstream of the dam are inconclusive in determining the hazard potential of the dam, a dam break analysis should be performed and results of the analysis furnished in the report. The dam break analysis should consider failure under normal operating conditions and flood flows up to the rate where no significant increase in hazard to downstream life and property occurs as a result of failure. An inundation map and, if necessary, water surface profiles, should be developed and furnished for the flow condition which results in the greatest potential for loss of life and significant property damage. The method and assumptions utilized in the dam break analysis should be fully documented. The inundation map and water surface profiles should delineate the affected areas and water surface elevations prior to and after the assumed failure. The map and profiles should also show the travel time of the flood wave at critical points downstream of the dam. It is important that the inundation map be developed at a scale sufficient to be used for identifying downstream inhabitants within the area subject to possible danger.

5-5 Review and Updating of Plans. All aspects of the EAP are subject to periodic review and updating in accordance with the guidelines and the specific and detailed instructions contained in Section 12.24(a), (b), and (c) of the Regulations. A licensee must conduct a comprehensive review of the adequacy of the EAP at least once a year. In this review a determination of any new developments or other changes downstream or elsewhere will be made to determine whether any revisions to the current EAP, including inundation maps, are necessary. It is imperative that the licensee furnish the Regional Director with updates to the EAP immediately upon becoming aware of the necessary changes to ensure that the EAP is workable. This includes revisions when phone

numbers and/or names change for Regional Office contacts. The licensee must annually test the EAP and furnish to the Regional Director, within thirty days of the test, a statement that the EAP has been tested and should include a critique of the test and any revisions or updates to the plan or a statement that no revisions or updates are needed.

5-6 Annual Inspections. All operation and inspections of constructed projects will assess and verify compliance with the requirements for EAPs. This will include compliance with conditions of exemption contained in Section 12.21(c) of the Regulations and a recommendation for continuation or revocation of the exemption in accordance with Section 12.21(d) of the Regulations. The inspecting engineer should include statements of his findings and the reasons therefore in the appropriate paragraph of the inspection report.

When omissions or deficiencies in the EAP are discussed with the licensee's representative and appropriate direction is recommended, this should be documented in a follow-up letter to the licensee requesting a report and schedule for a proposed plan of action to be taken by a certain date. The inspection report should also document the discussion and state that follow-up action has been, or will be, taken on the matter. The EAP should be revised accordingly, with three copies of any revisions being forwarded to the Regional Office.

5-7 Posting and Readiness. An up-to-date copy of the flow-chart and/or notification list should be posted in a prominent location readily accessible at the project site and dispatch center near a telephone and/or radio transmitter. A copy of the complete EAP should also be available to the operators and dispatch center personnel. Each licensee must annually test the state of training and readiness of key licensee personnel responsible for actions during an emergency to assure that they know and understand the procedures to be followed and actions required during an emergency. The test is known as a drill and involves simulating emergency conditions.

A critique of each annual drill and lessons learned should be furnished to the Regional Director within thirty days of the date of the drill.

This test should be discussed during the annual operation inspection.

Coordination and consultation with local government, law enforcement officials and other organizations should be made in order to enhance the realism of the drill. Their involvement will perfect the close coordination with those agencies which is so necessary for a successful execution of the EAP in an actual emergency.

A critique of each annual drill and lessons learned should be furnished to the Regional Director within thirty days of the date of the drill. The drill should be discussed during the annual operation inspection. (Refer to Section 3-2B.6 of this manual.) Therefore, the Regional Director has the responsibility to ensure that each EAP is tested annually. The licensee is to conduct an annual drill of each of its EAP's each year.

In addition, the licensee may be required by the Regional Director to conduct an in-depth test, or comprehensive (functional or full scale) exercise, of its EAP procedures, to include active participation and interaction of licensee personnel with State and local emergency preparedness agencies. Chapter VI of the Engineering Guidelines discusses comprehensive exercises in detail. Regional office staff will attend the comprehensive exercises as observers and will participate in the follow-up oral critique.

A written critique, in the form of a formal report, is to be prepared by the licensee and submitted to the Commission within 60 days of the comprehensive exercise. The format for the report appears in Appendix 6-D of Chapter VI of the Engineering Guidelines.

Once the written critique is received from the licensee, the Regional Director should review its contents and send a letter to the licensee with Staff's comments on the report and on the licensee's proposed plan and schedule for follow-up action.

It should be remembered that the purpose of the exercise is to identify areas for improvement of the EAP. The licensee will not be held accountable for shortcomings identified exclusively in the State or local agencies domain.

Copies of revisions to the EAP resulting from the annual review, annual drill, and/or comprehensive exercise should be furnished to all persons to whom the existing EAP has been distributed.

5-8 Radiological Emergency Response Plan. Under the provisions of Section 12.22(c) of the Regulations, each owner of a hydroelectric project under the jurisdiction of the Commission with operating or other personnel located within a 10-mile radius of a nuclear power reactor shall be directed by the Regional Director to prepare a radiological emergency response plan to be implemented in the event of a severe accident or incident resulting in the release of radioactive materials from a nuclear plant. This will be a supplement to the EAP and generally be subject to the same inspection and review as the main body of the EAP. Plans shall be submitted in accordance with the time of filing established by Section 12.22(c)(3) of the Regulations. Contents of the plan shall conform to the provisions of Section 12.22(c)(2) of the Regulations and instructions contained in the guidelines.



## CHAPTER VI

### MONITORING, INSPECTING, AND REPORTING ON ENVIRONMENTAL AND PUBLIC USE COMPLIANCE MATTERS RELATED TO LICENSED PROJECTS

6-1 General. The purpose of the EPUI is to provide a thorough inspection of the public use resources, cultural resources, fish and wildlife resources, miscellaneous resources, and public safety requirements of license articles. The Environmental and Public Use Inspection (EPUI) for licensed projects with significant recreation development and/or environmental and public use issues should be conducted by staff personnel in the Regional Offices or, when requested, with assistance of other staff.

Inspectors will review both physical and operational features of the project's environmental/public use facilities and will review compliance with all applicable license requirements that can be evaluated in the field. Public safety measures at each project will also be evaluated.

6-2 Frequency of Inspections. To monitor, evaluate and assure continuous compliance with the environmental and public use requirements, every licensed project requires a periodic review. The EPUI inspections are in addition to the inspections described in Chapters II and III. Generally, an EPUI will be conducted every three to five years for projects having significant environmental and/or public use license requirements. Examples of significant requirements are larger, heavily used, recreational developments; significant public safety issues or requirements; fish passage facilities; and wildlife mitigation areas, etc. For projects having minor environmental and/or public use license requirements, five-year field inspection intervals will be maintained. Examples of minor requirements are small, or little used public areas; and no specific requirements for fish and wildlife facilities at the project which require special operation and maintenance procedures. However, there may be times when a project, regardless of size should be inspected on an annual basis. Annual inspections may be necessary when a particular environmental/public use controversy, special problem, or other issue is under consideration. In these instances, annual inspections would continue until the issue is resolved. Finally, there are projects that do not require field inspections. These are projects that have no environmental concerns or public use development. A list of such projects will be identified and maintained in each regional office and will be reviewed annually, using current operation reports, to determine if conditions have changed and an EPUI is necessary.

6-3 Preparation of the Environmental and Public Use Inspection (EPUI) Report. EPUI reports prepared by regional offices should be titled "Environmental and Public Use Inspection." These reports will include a cover page with logistics and a summary of findings followed by narrative and photographic sections. The narrative should discuss compliance with license articles, order, exhibits, agreements, and compliance with Commission rules and regulations and policy (Section 2.7, and Part 8), the adequacy, use, and maintenance of environmental and recreational facilities, and any remedial actions recommended. The following outlines the EPUI

report format and contents. The EPUI report is a public document, available from the Commission's Office of External Affairs (See Appendix 5 for example of an EPUI report).

Cover Page (Use Operation Report format with title modified to EPUI Report).

Logistics. The cover page will include the following:

Regional Office  
Report Period  
(Date of Previous EPUI to Date of This Inspection)  
Licensee/Exemptee  
Project Number  
Project Name  
Project Location by Waterway, County, and State  
Date License/Exemption Issued/Expires  
Latest Recreation or Environmental Amendment  
Date(s)  
Weather Conditions  
Stream Flows During Inspection  
FERC Inspector's Name(s)  
Licensee Representatives (Name/Title)  
Other Participants by (Name/Title/Agency)

Summary of Finding. Summarize all compliance and adequacy concerns and remedial actions needed.

A. General Description of the Project

1. Project Area Description. In order to understand the recreational and environmental values of the project setting, a brief description of the project area should include the project location, area topography, surrounding land uses, accessibility, aesthetics, the types of recreation that occur in the project area, and other unique features.

2. Description of the Development. Briefly describe the development reservoir, tailrace area, water quality, project operation, project capacity in megawatts or kilowatts, and project boundary and lands as they pertain to recreational and environmental values.

B. Project Resources and Facilities

1. Public Use Resources and Facilities.

a. Description of Facilities/Resources. For each project development, provide a summary description of project public use facilities and activities that are available, such as campgrounds, picnic areas, docks, ramps, swimming, hiking, boating, etc. Comment on public use facilities within, adjacent to, or near the project boundaries that influence public use at the project. Comment on facility condition, operation and maintenance, noting who operates the facility, management practices, seasons in operation, user fees, etc. Report on any plans for future recreational development by licensee/exemptee, or any other entities that could effect the project. Comment on the licensees' efforts to comply with the Americans with Disabilities Act (ADA).

b. Compliance with Requirements and Exhibits. Comment on licensee/exemptee compliance with license articles, approved recreation plans, or Commission Orders relative to public use resources and facilities. Note any discrepancies with Form 80 information. Comment on Part 8 requirements and ensure that Section 8.2 signs are adequately maintained and properly worded.

For projects with approved recreation plans and/or measures, note whether all required items have been implemented. Note whether required facilities have been built and if they accurately reflect facilities in the approved plan. In the event there are major differences, report whether the facilities or the plan needs to be modified.

Report on any unauthorized uses of project lands and waters by others and, where appropriate, document actions taken to remind the licensee or exemptee of its responsibility to prevent any uses not authorized.

The Commission expects (under Part 2.7b of 18 CFR) licensees to assume the responsibility for developing suitable public recreational facilities upon project lands and waters and to make adequate access to such project facilities and waters and to consider individuals with disabilities in the design and construction of such project facilities and access. It is the licensee's responsibility to ensure compliance with the ADA. The Justice Department is responsible for enforcement of ADA violations. If new or improved recreational facilities are planned for a project, the Regional Office should remind the licensee of its responsibility to comply with ADA. The FERC inspector should discuss any ADA concerns with the licensee. The inspection follow-up letter to the licensee/exemptee should include the ADA concerns discussed in the field. If the licensee refuses to comply, Regional Office staff should call DLC to informally discuss how to proceed on a case-by-case basis.

c. Adequacy of Public Use Features. The EPUI report should include an evaluation of the adequacy of the recreation provided at the project. Form 80 information should be verified and other recreation information used to determine if existing project recreation facilities satisfactorily provide for the recreation demands at the project.

2. Cultural Resources and Facilities.

a. Description of Cultural Resources/Facilities. Identify cultural resources (historic sites and structures, archeological sites, Native American religious areas, etc.) for which license/exemption conditions and orders require specific actions and/or studies. Photos/locations/descriptions of particularly sensitive resources need not be disclosed if it would increase chances of vandalism or theft. If necessary, sensitive resources could also be described in a non-public supplement to the EPUI. Describe mitigation or other management activities by the licensee/exemptee, or other entities.

b. Compliance with Requirements. Describe facilities and/or measures required to protect cultural resources. Comment on licensee/exemptee compliance relative to cultural resources, plans, conditions, or orders requiring specific actions and/or studies. For projects having approved cultural resources plans and/or measures, describe status and follow-up if compliance measures are not progressing adequately.

c. Adequacy of Cultural Resources Plan and Facilities. Comment on the adequacy of the plans and measures in protecting cultural resources. Note any major differences in the cultural resources plan and on site conditions. If necessary, provide comments to amend the plan or license.

3. Fish and Wildlife Resources and Facilities.

a. Description of Resources and Facilities. Identify any specific fish or wildlife species for which license/exemption conditions or orders require actions or studies. Describe facilities or actions required to protect, mitigate, or enhance project fish and wildlife resources, such as bypass facilities and wildlife mitigation areas. Describe operation and maintenance of facilities and the adequacy thereof.

b. Compliance with Requirements. Address licensee/exemptee compliance with license articles, approved fish and wild life plans, and Commission Orders pertaining to fish and wild life matters. For projects having approved fish and wildlife plans or measures describe status of implementation. Note whether all required facilities have been built and are operated as approved. Determine any major differences in the facilities' development and operation from the approved facility design and operation. If there are differences, determine whether the facilities or plan needs to be modified and report your determination.

c. Adequacy of Fish and Wildlife Resources and Facilities. Assess the adequacy of the project's fish and wildlife facilities, features, and operations as they relate to existing and projected resource needs.

4. Other Environmental Facilities and Resources.

a. Description of Other Resources/Facilities. Identify and describe environmental license conditions and project characteristics that are not included in items 1 through 3 above. This includes reasonable measures employed to prevent sedimentation and shoreline erosion of streams, rivers, etc., pollution prevention measures at the project, including powerhouse containment and other spill prevention systems; water quality monitoring and studies; reasonable measures to remove trees, logs, and debris from reservoirs, streams or shorelines; monitoring of other on-going environmental mitigation; and settlements/agreements with resource agencies that are incorporated in the terms of the license or exemption; etc.

b. Compliance with Requirements. Describe measures required to comply with requirements and/or conditions. Note any differences in plans and on site conditions and identify actions necessary to attain compliance.

c. Adequacy of Other Facilities/Resources. Assess the adequacy of the facilities/resources and determine if the facilities adequately provide for intended uses and purposes.

C. Public Safety Resource/Facilities.

1. Description of Facilities. Report on the measures taken by licensees/exemptees to protect life and property including the installation of: safety barriers to restrict people and boats from spillways or other dangerous areas; fencing to discourage public entry to hazardous areas; warning signs, signals, buoys, lighting and audible alarms to denote sudden changes in water releases below the powerhouse and spillway; provisions to keep snowmobilers and ice fishermen from thin ice areas near project structures and swimmers from dangerous areas; and buoys and signs to warn sail boaters away from low bridges, transmission and communication lines (see Section 12.43 of 18 CFR). Note the issuance of safety brochures or news releases by the licensee. The report should also indicate the level of maintenance of safety facilities. The D2SI publication titled "Guidelines for Public Safety at Hydropower Projects" should be referred to in determining existing or potential public safety hazards and in recommending prevention measures that licensees/exemptees should take to reduce or eliminate any such hazards. It is imperative that each inspecting staff member be familiar with the Public Safety Guidelines and its goals and objectives. If a Regional Office requires safety devices, it must enforce the requirement in a timely manner.

2. Compliance with Requirements. Comment on licensee/exemptee compliance with public safety requirements; including submission of a Public Safety Plan (Plan). The Commission has the authority to require public safety signs or other similar warning signs, if the Regional director deems them necessary to achieve public safety objectives. Note whether the project is subject to Part 12 safety requirements. If not, state that the installation of such devices or measures is recommended.

A Public Safety Plan is required for each project where public safety measures are necessary. The plan need not be overly complex. The plan should simply include a list of each safety device at the project and a schematic drawing showing the general location of each device. A sample drawing is shown in Figure 1 of the Public Safety Guidelines. All safety devices, such as fences, signs, boat barriers, buoys, log booms, audible devices, night illuminations, and beacon lights should be listed and shown on the drawing. Other data and descriptions that would be helpful include the approximate height and type of fences, the type of boat restraining barriers, the approximate distance of the barriers from the spillway, the wording on the sign, and the type and schedules for audible warning devices. A sample letter requesting the Public Safety Plan is shown in Appendix 9 of the Public Safety Guidelines. A detailed review of the Public Safety Plan is not conducted until Regional Office staff make a project inspection. Installation, operation and maintenance of all public safety devices will be reviewed during each inspection and compared to the Public Safety Plan. Minor discrepancies can be noted on the plan, however, a request for revision is left to the inspector's discretion. The accuracy of device location should be commensurate with how well the plan was drawn (i.e. to scale). Any comments should be addressed to the licensee/exemptee in the field and included in the follow-up letter. The EPUI should list the most recent submission date for the Public Safety Plan and the date that the Plan was accepted by the Regional Director. If a Plan has not been submitted, list the date that it was requested by the Regional Director and the schedule submission date. If a Public Safety Plan is not currently required and public safety measures become necessary in the future, a Public Safety Plan should be requested at that time.

3. Adequacy of Public Safety Measures. Comment on the accuracy and adequacy of the project's Public Safety Plan compared to existing project conditions. Report on the adequacy of the licensee's or exemptee's actions to protect life and property, such as the installation, condition, and efficiency of safety devices and measures.

Identify and report on project hazards such as transmission lines crossing reservoirs, dangerous swimming areas, low bridges or shallow areas in boating and water skiing zones.

Requirements regarding vertical clearances for power or communication lines over reservoirs are set forth in Section 12.43 of the Commission's regulations. Regional Directors should require signs or other measures to advise the public of the clearances for any power or communication lines above project waters. Subsequent to March 1, 1981, clearances for power or communication lines must be constructed to conform to the current National Electrical Safety Code.

The installation of devices to protect the public safety at licensed and exempted projects is an important element of the Part 12 regulations. Improvements or additions must be required at any project when there is a need to increase the level of protection. Inspectors should verbally point out to owners where improvements or additions can be made, and should follow-up with a requirement to do so in an expedited letter from the Regional Director. In addition, booms or other devices that are removed during the winter or have been removed for maintenance, a

reminder during the inspection and letter to the owner requiring restoration immediately or prior to the recreational season is needed. In particular, all projects should be reviewed to ensure that all free-flow spillways have some type of warning or protection devices and that other facilities (gated spillways, powerhouses, etc.) have adequate protective devices as dictated by the physical circumstances at each project. During project inspection, any danger to the public from operation of a project should be noted, existing safety installations should be re-evaluated, and the report of the inspection should include a discussion of their adequacy.

D. Findings and Follow-up Actions. Report any important changes in the project that could require an amendment to the project license/exemption regarding recreation or environmental matters. Other recommendations should be based on the inspection and/or resource analysis. Follow-up actions taken concerning each recommendation shall be included with reference to necessary follow-up correspondence made to the licensee.

E. Photographs and Exhibits. Provide a photographic record of the field inspection to assist in illustrating project conditions. Provide appropriate figures and maps to augment the narrative portions of the report.

## CHAPTER VII

### INSPECTIONS AND REPORTS FOR EXEMPTION PROJECTS

7-1 General. The Commission established procedures for exempting from all or part of Part I of the Federal Power Act certain small hydroelectric power projects having a proposed installed generating capacity of 5 MW or less when it issued Order No. 106 on November 7, 1980 and Order No. 202 on January 19, 1982 (Sections 4.101 through 4.113 of the Regulations) and small conduit hydroelectric facilities having an installed generating capacity of 15 MW or less, Order No. 76, April 28, 1980 (Sections 4.90 through 4.94 of the Regulations). On June 15, 1983, the Commission stayed further application of Order No. 202 thereby halting further issuance of categorical exemptions but leaving in effect those already issued.

The Commission's primary interest in these projects is for their safety, environmental impacts, and timely construction in accordance to approved plans, and operation consistent with the terms and conditions of exemptions, particularly those prescribed by fish and wildlife agencies. To serve these interests, Regional Office personnel must inspect these projects from time to time. The nature and frequency of these inspections depends on the type of exemption, the hazard potential of the projects, and environmental impacts.

7-2 Administration of Exemptions. Administration of the terms of exemptions is primarily a function of the regional offices. Standard Articles 1, 2, 3, 5 and 8 of a case-specific exemption will require the most attention by the Regional Office. In addition, attention is required to ensure compliance with the terms and conditions prescribed by fish and wildlife agencies.

In Standard Article 1 the Commission reserves the right to conduct investigations with respect to any acts, complaints, facts, conditions, practices, or other matters related to the construction, operation, and maintenance of the exempt project, and, if any term or condition of the exemption is violated, the Commission may revoke the exemption.

In Standard Article 2, the Commission requires that the exempted comply with fish and wildlife conditions prescribed by Federal and State resource agencies. It is extremely important to identify any problem areas of non-compliance so that appropriate corrective action is taken.

Pursuant to Standard Article 3, the Commission has established a policy of revoking the exemption if the project owner has not begun or completed construction of any proposed generating facilities within the time limits specified. The time limit for start of construction is 18 months for exemptions issued prior to March 23, 1985, and two years for those issued thereafter (Order No. 413). A four-year limit for completion of construction applies for all exemptions. Extensions of time to start construction may be granted by the Commission for good cause.

In accordance with Standard Article 5, the Regional Director should verify that the exempted has obtained, from the administering Federal land management agency, the acquisition



of rights to use the land involved within one year from the date on which the exemption was granted.

If the exempted project qualifies, Article 8 applies 18 CFR Part 12 to the project exempted. For the purposes of applying the appropriate provisions of 18 CFR Part 12, the exempted project is deemed to be a licensed project development and the owner of the exempted project is deemed to be a licensee. If the exempted project is subject to Part 12, periodic staff inspections will be performed. Inspections of exempted projects will be in accordance with the procedures established in Chapters II and III.

## CHAPTER VIII

### INFORMAL COMPLAINTS AND NON-COMPLIANCE

8-1 General. This chapter relates to all non-compliance matters including both dam safety and non-dam safety matters. Dam safety matters are the responsibility of the Division of Dam Safety and Inspections (D2SI) and all other non-dam safety compliance matters are the responsibility of the Division of Licensing and Compliance (DLC). The purpose of this chapter is to establish procedures for (1) coordination with DLC on informal complaints submitted by any person, agency, or entity regarding any order or regulation issued by the Commission; and (2) ensuring compliance by licensees or exemptees with the terms and conditions of any license or exemption from license, issued by the Commission or with any regulation issued by the Commission applicable thereto. DLC has the primary responsibility for processing all complaints and non-dam safety compliance matters.

8-2 Informal Complaints. An informal complaint (complaints) may be submitted by any person, agency, or entity, regarding the actions of the Commission, any of its licensees, exemptees, permittees, applicants or an unlicensed project owner (see Section 385.206 of the regulations). Complaints are normally filed with the Secretary, FERC. However, complaints may also be filed with the Regional Director. If the Regional Office should receive an inquire from any party regarding the appropriate filing procedures, they should be advised to submit the complaint to the Secretary, with copies furnished to the Regional Director and the Director, Office of Hydropower Licensing.

#### 8-3 Coordination with DLC.

- A. DLC will review all complaints and determine the appropriate studies, research, or investigations required to process the complaint.
- B. If assistance is requested, DLC will request such assistance through the Director, D2SI. Assistance could involve a variety of matters, however, it is expected that the primary focus of such assistance will be in the form of special inspections related to the issues raised in the complaint.
- C. If the complaint is filed by a Federal or state agency and D2SI is requested to conduct an investigation, representatives of the agency should be invited to accompany RO staff on the inspection.
- D. After an inspection or investigation by the Regional Office, a report through the Director, D2SI to the Director, DLC should be prepared providing information on the issues in the complaint that were identified by DLC for inspection and investigation.

#### 8-4 Final Action on Complaints.

A. Final action by the Commission on any complaints could involve any of several actions, including but not limited to:

- (1) Enforcement Action;
- (2) Termination of license or revocation of exemption;
- (3) Cease and Desist Order by Commission;
- (4) Court injunctions; and
- (5) Penalties; etc.

8-5 Compliance - General. Licenses and exemptions, include a number of standard and special terms and conditions that require compliance within specific time limits or on a continuous (annual) basis. DLC has the primary responsibility for ensuring non-dam safety compliance and D2SI has the primary responsibility for ensuring dam safety compliance. However, during the typical inspections conducted by the Regional Offices, it is the responsibility of the Regional Office to identify any instance of non-compliance with such terms and conditions.

Non-compliance with any license, exemption, or any order, rule or regulation issued by the Commission is differentiated from non-compliance matters that are brought to the Commission's attention through a complaint. Normally, non-compliance cases will be the result of findings made by the Staff through its inspections program, investigations, review of plans, reports and other filings by licensees, or compliance monitoring.

8-6 Non-Compliance Procedures for Dam Safety and Public Safety Related Matters. On dam safety matters, DLC will be consulted prior to any non-compliance letter being sent. The staff inspector should direct efforts to resolving any problem found during an inspection, preferably while in the field. If any problem discovered relates to a dam safety matter, the objective should be to correct the problem. If corrected in a timely manner and there is no environmental or dam safety ramification, it should not be transferred for compliance action. If a problem occurs that is within the responsibility of DLC (non-dam safety matters), the first effort should be to correct the problem in the field. The history of the problem and, if appropriate, how it was remedied should be given to DLC to determine if any further action is necessary. Once the Regional Office believes it has exhausted all means available to achieve compliance, the matter should be discussed with the Director, D2SI to determine what further action should be taken. If the licensee/exemptee does not work cooperatively with the Regional Office in this regard, it may be necessary to transfer the matter to DLC for compliance action. D2SI will provide DLC with technical support on dam safety related matters.

8-7 Non-Compliance Procedures for Non-Dam Safety Matters. The following procedures should be followed in processing non-dam safety non-compliance cases:

A. If, during an inspection it appears that there is non-compliance with any order, rule, or regulation issued by the Commission the Regional Office will conduct a review to

ascertain the nature of non-compliance. In such instances the Regional Office will work with the Licensee/Exemptee to correct the non-compliance problem. If non-compliance is found, it should be reported to DLC.

B. In certain instances, DLC may determine that the Regional Office should resolve the non-compliance matter. In those cases the Regional Director will receive instructions on the procedures to be followed for resolving the non-compliance matter. Emergencies, for instance, may require contacts by telephone or telegram. Simple violations often can be handled by telephone. Any non-compliance matter that can be handled in the field should be identified by the inspector and the licensee/exempted should be advised by the inspector to correct the problem. Follow-up letters should confirm the request to correct any non-compliance matter.

C. If DLC determines that the non-compliance matter can be handled by direct contact by the Regional Director, the following steps will be followed:

(1) If the licensee or exempted is contacted by telephone, a telephone message memo should be prepared to document the call. The telephone conversation should be confirmed by sending the party contacted the telephone message with a cover letter.

(2) If appropriate, it may be preferable to arrange a meeting with the licensee or exempted to resolve the non-compliance problem.

D. A particular area of compliance relates to minimum flow requirements. Without question, the minimum flow issue is one of significant importance. Therefore, we must put forth a credible effort to ensure minimum flow compliance. To do this, licensees and exemptees will be required to have available for review, by the inspecting engineer, a hard copy of the recorded minimum flow releases, i.e., U.S.G.S. gaging records or licensee's records, including an explanation for those instances where the minimum flow requirement was not met.

The licensee or exemptee should also be requested to certify by letter or other form that the required minimum flows have been released for the time period between the time of latest available records and the time of the inspection.

With this approach, the Regional Office will be in a position to cross-check in succeeding years whether or not the licensee or exempted has correctly certified compliance with the minimum flow requirements. If there is serious non-compliance in the opinion of the engineer, the published data should be obtained from the licensee or exempted at the site, if possible, or shortly thereafter for use in any non-compliance action reported to DLC.

#### 8-8 Emergencies

A. If a complaint or non-compliance matter is related to an emergency, the above procedures are modified as follows:

(1) The emergency should be reported by telephone and, if possible, documented by a short memo delivered via telecopies or express mail.

(2) A telephone conference should be initiated as soon as possible between the Regional Director and the Director, D2SI so that we can appropriately advise DLC and mutually decide on a course of action.

(3) In an emergency, the Regional Office will receive specific instructions on the timing and need for any field inspections or other actions that are deemed appropriate.

8-9 Ex Parte Rules. In processing complaints, staff should be mindful of the Commission's ex parte rules. If a complaint is a formal filing, i.e. motion or petition, staff should discuss with their supervisor the limitations that may apply on contacts with the Complainant and the licensee, exempted, permittee, or developer. If the supervisor has questions on ex parte rules, they should be referred to the Director or Deputy Director, D2SI for discussion with OGC.

## CHAPTER IX

### UNAUTHORIZED CONSTRUCTION OR OPERATION

9-1 General. The purpose of this chapter is to establish procedures for reporting and preventing unauthorized construction or operation at projects that are under the jurisdiction of the Commission.

9-2 Unauthorized Construction Where an Application for License or Exemption, or a Declaration of Intention has not been Filed. Whenever unauthorized construction is found to exist for a project where an application for license or exemption, or declaration of intention has not been filed the following action should be taken.

A memorandum to the Director, Division of Licensing and Compliance (DLC) through the Director, D2SI should be prepared. The memorandum should include the following items:

- (1) A complete description of the project.
- (2) Power purchaser.
- (3) Construction completed to date should be described in detail.
- (4) Photographs of the project construction.

Any actions to advise the developer to cease further construction, and to file an application for license or exemption, or a declaration of intent will be the responsibility of DLC.

9-3 Unauthorized Construction Where an Application for License or exemption, or Declaration of Intention has been Filed. Whenever unauthorized construction is found to exist at a project where an application has been filed, either through a site inspection, or because it was reported in the application, the procedures described in 9-2 should be followed. A cease construction letter to the applicant will be prepared by DLC. Generally, such letters will request the following information for the site:

- (1) The start of construction date.
- (2) An item-by-item listing of construction completed and dates of completion.

DLC will also be advised of the unauthorized construction. Commission action on the application will be suspended until all the requested information is provided.

9-4 Unauthorized Construction at a Licensed or Exempted Project. Whenever unauthorized construction is observed at or reported on a licensed or exempted project, the Regional Director

shall report such matters as described above to DLC so that the licensee/exempted can be directed to stop construction and to either:

- (1) File an application for amendment to the Commission, or
- (2) Submit a letter to the Director, OHL describing the proposed changes, documenting consultation with the appropriate Federal and state agencies that indicates agency concurrence with the proposed changes, and requesting whether an amendment is necessary.

There are cases where construction activities will occur at licensed projects that do not involve construction of licensed project facilities. These could include, but are not limited to, municipal water supply facilities, non-project transmission facilities, flood control facilities, erosion control measures, and others. Since the construction of these non-project facilities will require Commission approval before initiation of construction, it is appropriate for the Regional Offices to report ongoing construction as an unauthorized activity.

DLC will decide whether to direct the licensee/exempted to cease further construction until notified of action required by the Commission.

9-5 Unauthorized Operation. Whenever unauthorized operation has been found, and whether an application has or has not been filed, the Regional Director should prepare a memorandum to DLC through D2SI. The memorandum should include the following:

- (1) A description of the project, as available.
- (2) Power purchaser.
- (3) The date of start and completion of construction, if known.
- (4) Turbine and generator name plate rating.

Based on this preliminary information, DLC will decide whether it is necessary to conduct an on-site pre-license type inspection as part of the jurisdiction studies that may be required.