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REG. no. 1318 of 18 December 2000: Regulations governing qualifications for those undertaking the planning, construction and operation of watercourse structures

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Regulations governing qualifications for those undertaking the planning, construction and operation of watercourse structures

Chapter 1. Introductory provisions

Section 1-1. Purpose

These regulations shall help ensure that personnel who undertake the planning, construction, operation and surveys of classified watercourse structures have satisfactory qualifications and are appropriately organised, cf. sections 2-2 and 5-2 of the regulations governing the safety and supervision of watercourse structures.

Section 1-2. Authority

These regulations are administered by NVE.

NVE will approve and check to make sure that the requirements for qualifications and organisation are met. NVE may reassess the approval and may also withdraw its approval.

Section 1-3. Definitions

In these regulations the following terms and definitions apply:

The entity responsible for a watercourse structure: Cf. section 1-3 of the regulations governing the safety and supervision of watercourse structures.

Renewal: Cf. section 1-3 of the regulations governing the safety and supervision of watercourse structures.

Manager: Cf. section 1-3 of the regulations governing the safety and supervision of watercourse structures.

Reassessment: Cf. section 7-3 of the regulations governing the safety and supervision of watercourse structures.

Inspection personnel: Cf. section 1-3 of the regulations governing the safety and supervision of watercourse structures.

The chartered dam engineer (VTA): Cf. section 1-3 of the regulations governing the safety and supervision of watercourse structures.

Section 1-4. Scope

Qualification requirements are specified for:

- a) personnel employed by the entity responsible for a watercourse structure, including the manager, the chartered dam engineer (VTA) and inspection personnel
- b) those who plan, design and reassess watercourse structures
- c) those who build or renew watercourse structures or who supervise construction or renewal.

The qualification requirements are related to the watercourse structure's class, cf. section 1-4 of the regulations governing the safety and supervision of watercourse structures. The personnel's qualifications shall be documented, and NVE may require that the documentation be submitted.

Chapter 2. Qualified personnel employed by the entity responsible for watercourse structures

Section 2-1. *Organisation of qualified personnel*

The responsible entity shall have sufficient qualified personnel, i.e. managers, VTAs and inspection personnel, who perform the tasks specified pursuant to the Act relating to watercourses and ground water, regulations governing the safety and supervision of watercourse structures and underlying regulations in order to meet the safety requirements related to the installations.

For entities responsible for many, large or complex watercourse structures or in cases where the installations are widely dispersed geographically, NVE may require additional qualified personnel.

The area of responsibility for a VTA shall be related to specific installations. The VTA shall be approved by NVE for these installations.

NVE may approve a VTA who is not employed by the responsible entity. In that case, there shall be a written agreement governing the employment. This agreement shall be approved by NVE.

The responsible entity shall appoint a deputy VTA with satisfactory qualifications. If this person is to serve for more than half a year, the person in question shall be approved by NVE.

When inspection personnel who are not employed by the responsible entity are used, there shall be a written agreement that governs the situation.

Section 2-2. *Qualification requirements for a manager*

A manager shall have undergone sufficient training about what it entails to be responsible for preserving the safety of watercourse structures.

NVE may require that the qualifications be documented and may specify further requirements for the manager's qualifications in individual cases.

Section 2-3. *Qualification requirements for a VTA*

A VTA shall have the following education and practical experience:

Table 2-3.1: Qualification requirements for a VTA.

Class	Education	Practical experience
3	Education at the university level as a Chartered Engineer (construction) or equivalent degree, with relevant technical subjects. A graduate in mechanical engineering may be acceptable if this is relevant to the task.	At least 3 years of relevant practical experience from safety work on dams and other watercourse structures.
2	Education equivalent to the requirements for a degree from a college of engineering as a civil engineer with relevant technical subjects. A mechanical engineer may be acceptable if this is relevant to the task.	At least 3 years of relevant practical experience from safety work on dams and other watercourse structures.
1	Education equivalent to the requirements for a degree from a college of engineering.	At least 3 years of relevant practical experience from safety work on dams and other watercourse structures.

In the event of relevant continuing education and practical experience of longer duration than that specified in Table 2-3.1, NVE may reduce the educational requirements.

VTAs in all classes shall have undergone specific theoretical training for this function and training on the relevant installations by a qualified person, such as the installations' previous VTA or approved professionally responsible officers in relevant professional fields, cf. Chapter 3 of these regulations.

The VTAs shall maintain and develop their own qualifications in connection with the VTA-function.

The VTA shall be approved by NVE.

Section 2-4. *Qualification requirements for inspection personnel*

The inspection personnel shall have a general knowledge of inspection, emergency preparedness, flood conditions and safety problems associated with watercourse structures and shall have undergone theoretical training in these subjects.

The inspection personnel shall know the watercourse and the relevant installations well.

The inspection personnel shall know instructions and routines that apply to the preservation of safety in the watercourse structures, such as the inspection programme

and contingency plans, the chain of responsibility and command, and reporting and warning routines.

NVE may require that the qualifications be documented and may specify further requirements for the inspection personnel's qualifications in individual cases.

Chapter 3. Qualification requirements for the planning, detailed design and reassessment of watercourse structures

Section 3-1. *Professionally responsible officer*

Planning, detailed design and reassessment of watercourse structures shall be done by professionally responsible officers who have approved qualifications in the relevant professional fields. The requirements for approved professionally responsible officers apply to construction, renewal and reassessment, but not to simple maintenance work.

The professionally responsible officer shall ensure that the part of the planning and detailed design or reassessment that comes under the professional field for which he/she is approved will be implemented and documented in accordance with the relevant technical requirements in the regulations governing the safety and supervision of watercourse structures and underlying regulations.

Approval is granted for the following professional fields:

- I concrete and/or masonry dams with foundation and spillways
- II earth dams with foundation and spillways
- III diversion works, pipes and adit gates
- IV flood hydrology

Professional fields I and II also include other structures in watercourse structures of the same materials.

All planning materials shall be checked by someone with equivalent qualifications to the professionally responsible officers who are designing or reassessing them. For installations in the strictest breach impact classes, NVE may require that an independent inspection be conducted.

Section 3-2. *Safety officer*

Planning and detailed design or reassessment shall be followed up by an approved safety officer. If only one professional field is involved, NVE may waive the requirement for a safety officer.

The safety officer shall check and ensure that the comprehensive planning and detailed design or reassessment is implemented and documented in accordance with the relevant requirements in the regulations governing the safety and supervision of watercourse structures and underlying regulations. The safety officer shall also ensure that all planning materials are prepared by professionally responsible officers and checked by persons with qualifications equivalent to those of the professionally responsible officers.

Section 3-3. *Qualification requirements*

In order to be approved as a professionally responsible officer or safety officer the applicant must have an education at the university level as a chartered engineer or some equivalent title. Relevant post-graduate education and practical experience of longer duration than that specified in Table 3-3.1, may reduce the educational requirements.

Requirements for practical experience depend on the class for which approval is being applied. The table indicates the minimum duration of total relevant practical experience:

Table 3-3.1: Requirements for practical experience for a professionally responsible officer or safety officer.

Function	Classes 3 and 2	Class 1
Professionally responsible officer in		
- professional field I, II, III	8 years	4 years
- professional field IV	6 years	4 years
Safety officer	8 years	4 years

The total practical experience in the last five years must not be less than one year.

The practical experience shall cover:

Professionally responsible officer:

Professional fields I, II and III:

- detailed design
- construction supervision and construction follow-up
- reassessment.
- Professional field IV
 - flood calculations in accordance with current Norwegian computation methodology

- flood diversion.

Safety officer:

- Planning of various types of installations specified under professional fields I, II and III
- Practical experience in several of the following areas:
 - detailed design
 - project management
 - reassessment
 - flood calculation
 - flood diversion
 - dam breach wave calculations
 - construction site management
 - construction supervision
 - construction follow-up
 - main inspection
 - safety assessment/risk analysis
 - responsibility for coordination
 - VTA-work.

Section 3-4. Requirements for documentation of qualifications

For NVE's assessment of the qualifications of the applicant, a special reference list relating to the relevant function and/or relevant professional field shall be submitted in addition to documentation that the general qualification requirements have been met.

This reference list shall include:

- a summary of the projects and/or installations that have been worked on, and a specification of type and dimensions
- a detailed description of the kind of work that has been done, cf. the list of requirements for practical experience in section 3-3
- a summary of where the applicant has been employed and when the work was done, with an indication of the duration of employment specified in months.

Further documentation can be required.

It may be required that documentation be submitted in Norwegian.

Section 3-5. *Approval*

An application for approval by the professionally responsible officer and safety officer shall be sent to NVE on a special form, which can be obtained from NVE.

NVE may specify restrictions on the approval in professional fields I, II and III if the applicant's qualifications warrant it.

Persons who are not granted general approval may apply for approval for the detailed design or reassessment of specific installations.

At any given time, NVE may check to make sure that approved professionally responsible officers and safety officers have at least one year of aggregate relevant practical experience in the last five years.

NVE keeps a list of professionally responsible officers and safety officers who have general approval.

Chapter 4. Qualification requirements for the construction and renewal of watercourse structures

Section 4-1. *Qualification requirements for those who build and renew*

Those who build and renew classified watercourse structures shall have approval as a «person responsible for implementation» in Class 3 in the relevant area of approval pursuant to section 2, sub-section 3 of the regulations governing third party certification of undertakings issued pursuant to the Planning and Building Act.

In addition, practical experience with the construction and renewal of watercourse structures is required in the relevant professional field. For work where there are no relevant areas of approval, particular emphasis will be given to practical experience in the relevant professional field.

NVE may require approval of the construction site manager and the person responsible for coordinating the work. The approval will be based on the applicant's education and relevant recent practical experience:

Table 4-1.1: Qualification requirements for the site manager and the person responsible for coordinating the work.

Class	Education	Practical experience
3 and 2	Education equivalent to the	At least 5 years of relevant

	requirements for a degree from a college of engineering as a civil engineer, with relevant technical subjects.	practical experience
1	Education equivalent to the requirements for a degree from a technical vocational school as a construction technician, with relevant technical subjects.	At least 3 years of relevant practical experience

Relevant continuing education and practical experience of longer duration than that specified in Table 4-1.1, may reduce the educational requirements.

For companies that produce and/or assemble equipment in professional field III, the production and assembly managers shall have an education and practical experience in the relevant professional field equivalent to the requirements for a construction site manager for technical construction work.

Section 4-2. *Qualification requirements for those supervising the construction and renewal of watercourse structures*

Those who supervise the construction and renewal of watercourse structures shall have satisfactory qualifications. In general, the same qualification requirements will apply as for the construction site manager and the person responsible for coordinating the work, cf. Table 4-1.1.

NVE may require that the qualifications be documented and may impose further requirements on the supervisor's qualifications in individual cases.

Chapter 5. Final provisions

Section 5-1. *The regulations' entry into force*

The regulations enter into force on 1 January 2001.