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## GOVERNMENT NOTICE

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### DEPARTMENT OF WATER AFFAIRS

No. R. 890

1 September 2009

#### NATIONAL WATER ACT, 1998

#### DRAFT REGULATIONS REGARDING THE SAFETY OF DAMS UNDER SECTION 123(1) OF THE NATIONAL WATER ACT, 1998

The Minister of Water and Environmental Affairs intends under section 123(1) of the National Water Act, 1998 (Act No. 36 of 1998), to make the Regulations in the Schedule relating to the safety of dams.

The Regulations promulgated by Government Notice R 1560 of 25 July 1986, will be repealed.

In terms of section 69(1) (a) (ii) of the National Water Act, 1998, interested parties are invited to submit written comments in connection with the proposed Regulations before 30 November 2009 to the Director-General: Water Affairs, Private Bag X313, Pretoria, 0001; Fax No. (012) 336-8674; e-mail: [modipanes@dwaf.gov.za](mailto:modipanes@dwaf.gov.za), for the attention of the Dam Safety Office or Ms M S Modipane.



Ms Pam Yako

DIRECTOR-GENERAL

Letter signed by: Ms N Ngele

Designation: Director-General (Acting)

Date: 4/8/09

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**Definitions**

1. In these Regulations any word or expression to which a meaning has been assigned in the Act shall have that meaning and, unless the context otherwise indicates –
  - (1) **“alter a dam with a safety risk”** means significant construction work to alter components or sections of the dam that may have an impact on the safety of the dam, but excluding normal maintenance or refurbishment work;
  - (2) **“approved professional person”** means a person registered in terms of the Engineering Profession Act, 2000 (Act No. 46 of 2000), and approved by the Minister after consultation with the Engineering Council of South Africa (established by section 2 of that Act);
  - (3) **“catchment parameters”** includes the average slope of the longest watercourse, average slope of the catchment area, catchment shape and distance to its centre of gravity, vegetation type and coverage and particulars of dolomitic or endorheic areas;
  - (4) **“completion certificate”** means a written statement issued by the approved professional person confirming that construction work, in his or her view, has been completed in accordance with the applicable design, drawings and specifications;
  - (5) **“condition affecting the safety of a dam”** means any condition of or event in respect of a dam with a safety risk, or a component thereof, including –
    - (a) significant damage of the dam wall or spilling caused by natural phenomena such as floods and earthquakes;
    - (b) failure or unusual movements or subsidence of any part of the dam or foundation thereof;
    - (c) unusual seepage or leaks which occur or which increase abnormally in the course of time or which remove material;
    - (d) defects in the dam wall or its components, which could in the course of time lead to a failure of the dam;
    - (e) deterioration of the dam wall or the forming of cracks, including the starting of new cracks or the lengthening or widening of existing cracks;
    - (f) the occurrence of sinkholes in the dam wall or reservoir;
    - (g) the movement of material masses near the perimeter of the reservoir;
    - (h) unusual instrument readings;
    - (i) significant damage to slope protection;
    - (j) unserviceability of spillways and floodgates;
    - (k) unserviceability of outlet works required for lowering of the water level in an emergency; and
    - (l) incidents of sabotage or vandalism,which poses a threat to the safety of the dam or holds a risk of loss of life, economic loss, or detrimental effect to resource quality, or is likely to pose a threat or hold any risk, or is likely to develop into any condition or event;

- (6) **“dam”** includes any existing or proposed structure which is capable of containing, storing or impounding water (including temporary impoundment or storage), whether that water contains any substance or not;
- (7) **“dam with a safety risk”** means any dam –
- (i) which can contain, store or dam more than 50 000 cubic metres of water, whether that water contains any substance or not, and which has a wall of a vertical height of more than five metres, measured as the vertical difference between the lowest downstream ground elevation on the outside of the dam wall and the non-overspill crest level or the general top level of the dam wall;
  - (ii) belonging to a category of dams declared under section 118(2) of the Act to be dams with a safety risk; or
  - (iii) declared under section 118(3)(a) of the Act to be a dam with a safety risk;
- (8) **“decision recommendation”** means the advice given to a decision-maker by an approved professional person as to which of a range of alternative courses of action should be preferred, based on factors that fall within the area of responsibility and competence of the approved professional person;
- (9) **“decommission a dam with a safety risk”** means taking steps to ensure that the remaining structure will, without any further operational action, maintenance, inspection or safety evaluation, hold no danger or potential danger to human life or property, have no significant adverse impact on resource quality, or significant detrimental effect on the environment;
- (10) **“development”** includes houses, dwellings, churches, places of worship, schools, factories, buildings, roads, bridges, river crossings, railway lines, dams, canals, pipelines, power lines, telephone lines, other lines of communication, other infrastructure, cultivated lands, orchards, or any land use;
- (11) **“emergency”** means an imminent, expected, foreseen, anticipated or actual sudden release of water from a dam with a safety risk as a result of a natural disaster, an accident, a condition affecting the safety of the dam, or failure of the dam or a part thereof;
- (12) **“emergency preparedness plan”** means formal documents that identify potential emergency conditions at a dam and which specify pre-planned actions to be followed to minimise loss of life, damage to property and adverse effects on resource quality: and –
- (a) describe actions that the owner of the dam with the safety risk, or person in control, must take to address safety problems at the dam;
  - (b) contains appropriate procedures and information to assist the owner of the dam in issuing early warning notification messages to responsible disaster management authorities, representatives of local authorities, representative bodies or of any communities potentially threatened by the condition of the dam and with whom arrangements have been made in connection with the issue of warnings; and
  - (c) contains engineering drawings of the dam and inundation maps to show disaster management authorities critical areas for action in case of an emergency.

- (13) **“failure modes and effects analysis (FMEA)”** means an inductive method of analysis where particular faults or initiating conditions are postulated and the analysis reveals the full range of effects of the fault or the initiating condition on the system;
- (14) **“full supply level”** means the level at the dam where the reservoir is considered to be one hundred percent (100%) full under normal operating conditions. For a reservoir where the outflow is wholly or partly controlled by movable gates, siphons or by other means, it is the maximum level at the dam to which water may rise under normal operating conditions, exclusive of any provision for flood surcharge;
- (15) **“hazard potential”** means a qualitative indication of the potential loss of life, potential economic loss, or potential impact on resource quality that any failure of a dam with a safety risk could have as a result;
- (16) **“owner”** includes “owner of a dam” or “owner of a dam with a safety risk”;
- (17) **“potential impact on resource quality”** means the effect that failure of a dam could have on the water resource and is, for the purposes of these Regulations, related to a prescribed system for classifying water resources, or equivalent system being used by the Director-General at the time of classification of a dam with a safety risk;
- (18) **“professional team”** means a group of persons with expertise in disciplines in which expertise is required, and which disciplines have been determined by the approved professional person concerned with the concurrence of the Director-General, and who after submission of particulars of their names, qualifications and professional experience have been approved by the Director-General;
- (19) **“regional maximum flood”** is a probabilistic-empirical upper limit estimation of the expected flood peak at a dam site based on the Francou-Rodier approach. The regional maximum flood must be calculated from the following formula:
- $Q = c \times A^b$  where:
- Q** = the regional maximum flood in cubic metres per second;
- A** = the catchment area in square kilometres; and
- c** and **b** are regionalised factors currently in use in South Africa when applying the formula. The factors might be adapted from time-to-time depending on a review of existing or new flood records, or appropriate research;
- (20) **“repair a dam with a safety risk”** means significant construction work to re-instate damaged components or sections of the dam excluding normal maintenance, but includes the reconstruction of dams that have failed or breached;
- (21) **“reservoir”** means the body of water impounded by a dam or a dam with a safety risk;



- (22) **“risk”** means the measure of the probability and severity of an adverse affect to life, health, property, or the environment. In the general case, risk is estimated by the combined impact of all triplets of scenario, probability of occurrence and the associated consequence. In the special case, average risk is estimated by the mathematical expectation of the consequences of an adverse event occurring (that is, the product of the probability of occurrence and the consequence, combined over all scenarios);
- (23) **“risk analysis”** means the use of available information to estimate the risk to individuals or populations, property, or the environment from hazards. Risk analyses generally contain the following steps: scope definition, risk (hazard or failure modes) identification, and risk estimation. Risk analysis involves the disaggregation or decomposition of the dam system and sources of risk into their fundamental parts.
- (24) **“risk assessment”** means the process of making a decision recommendation on whether existing (or future) risks are tolerable and present (or future) risk control measures are adequate, and if not, whether alternative risk control measures are justified or will be implemented. Risk assessment incorporates the risk analysis and risk evaluation phases;
- (25) **“risk estimation”** means the process of quantifying the probability and consequences components of risk;
- (26) **“risk evaluation”** means the process of examining and judging the significance of risk. The risk evaluation stage is the point at which values (societal, regulatory, legal and owners) and value judgements enter the decision process, explicitly or implicitly, by including consideration of the importance of the estimated risks and the associated social, environmental, economic and other consequences, in order to identify and evaluate a range of alternatives for managing the risks;
- (27) **“risk identification”** means the process of determining what can go wrong, why and how;
- (28) **“safety evaluation flood”** means an extreme flood considered appropriate for the specific structure, which after routing through the reservoir and spillway system may bring the dam close to the point of failure whilst the resulting damage, although substantial, must not be of such a nature so as to cause failure of the dam;
- (29) **“task”** includes a task relating to designing, constructing, altering, repairing, impounding water in, operating, evaluating the safety of, maintaining, monitoring or decommissioning a dam with a safety risk;
- (30) **“the Act”** means the National Water Act, 1998 (Act No. 36 of 1998); and
- (31) **“total freeboard”** means the vertical distance between the normal full supply level of the reservoir and the non-overspill crest of the dam, excluding camber, but including adequately designed parapet walls or wave barriers proud of the crest.

**Classification of dam with safety risk**

2. (1) Every dam with a safety risk must be classified in accordance with this regulation on the basis of its size and hazard potential to determine the level of control over the safety of the structure that is applicable in terms of these Regulations.
- (2) The size classification of a dam with a safety risk is based on the maximum wall height in accordance with Table 1 of the Annexure.
- (3) The hazard potential classification of a dam with a safety risk must be effected in accordance with the parameters as set out in Table 2 of the Annexure.
- (4) The hazard potential rating for a given dam in terms of Table 2 must be the highest level as determined by the separate consideration of the potential loss of life, potential economic loss and potential impact on resource quality downstream of the dam.
- (5) When the potential impact on resource quality due to failure of a dam with a safety risk is assessed as contemplated in column 4 of Table 2, the quality of water stored in the reservoir as well as the estimated volume of sediment and water that can be released from the reservoir must be taken into account.
- (6) If the water stored in the reservoir contains hazardous or highly hazardous substances the hazard potential rating must be significant or high, respectively.
- (7) The Director-General or an officer of the Department designated by him or her must carry out the size and hazard potential classification of each dam with a safety risk and notify the owner or person in control of the dam of the classification.
- (8) The Director-General or the designated officer of the Department may from time to time, or when new information comes to his or her attention, revise the classification of any dam with a safety risk, and must notify the owner or person in control of the dam concerned in writing of any alteration in the classification.
- (9) The owner of a dam with a safety risk must, when requested in writing to do so by the Director-General, furnish any information needed for classification of the dam.
- (10) When an owner intends to construct a new dam with a safety risk or to enlarge, alter or repair an existing dam with a safety risk, he or she must, after completion of the feasibility studies for the proposed project, furnish the Director-General with the following information for purposes of classification:
  - (a) The full name, contact details and address of the owner of the dam and that of the person in control;
  - (b) the locality of the dam including a description as contained in the title deed of the property concerned, magisterial district, nearest town, the distance to the nearest town, the name of the river or watercourse wherein situated (if any), the location in terms of latitude and longitude (to the nearest second of accuracy) and the water management area;
  - (c) the purpose of the scheme, the water use and the users of the water;

2. (10) (d) the type of dam;
- (e) in the case of an enlargement, alteration or repair to an existing dam, a description of the nature and extent of the intended enlargement, alteration or repair;
- (f) the maximum proposed height of the wall;
- (g) the total crest length of the wall;
- (h) the gross storage capacity of the reservoir;
- (i) the surface area of the reservoir at full supply level;
- (j) the maximum depth of water at full supply level; and
- (k) particulars on a plan of a suitable scale of the nature and locality of development downstream of the dam in the area that would be threatened by a failure of the dam.

#### **Use of classification of dam with safety risk**

3. (1) The requirements to be complied with relating to a dam with a safety risk in respect of design, construction, putting into operation, maintenance, monitoring, dam safety inspections, dam safety evaluations, and decommissioning of the dam must be determined in accordance with the category classification as set out in Table 3 of the Annexure.
- (2) The Director-General may, where he or she considers that circumstances justify it, assign a category classification to a dam other than that indicated by Table 3.

#### **Requirements for issuing of licence to construct, enlarge, alter or repair dam with safety risk**

4. No person who intends to construct a dam with a safety risk, or enlarge, alter or repair an existing dam with a safety risk, may begin any construction work, including –
- (a) any preparation of the foundations;
- (b) storage of construction materials, including aggregate, earth and rock;
- (c) development of quarries or borrow areas;
- (d) diversion of the watercourse concerned or any works incidental thereto; and
- (e) in the case of the enlargement, alteration or repair of an existing dam, steps to change the existing structure or equipment,
- before he or she is in possession of a licence to construct, enlarge, alter or repair, issued by the Director-General.

**Licence application for category I dam**

5. An owner who intends to construct a Category I dam, or to enlarge, alter or repair an existing dam so that the completed dam can be classified as a Category I dam must apply for a licence to construct by submitting to the Director-General –
- (a) An official application form obtained from the Department and signed by the applicant;
  - (b) a design report in accordance with regulation 6;
  - (c) engineering drawings in accordance with regulation 7; and
  - (d) an evaluation of the safety of existing development (including river crossings) that could be affected by the dam in accordance with regulation 8, and which must be included in the design report.

**Design report for category I dam**

6. A design report contemplated in regulation 5 for a Category I dam must include the following information on the proposed project:
- (a) General details of the project:
    - (i) The name and address of the owner of the dam and that of the person in control;
    - (ii) the locality of the dam including a description as contained in the title deed of the property concerned, magisterial district, nearest town, the distance to the nearest town, the name of the river or watercourse wherein situated (if any), the location in terms of latitude and longitude (to the nearest second of accuracy) and the water management area;
    - (iii) the purpose of the scheme, the water use and the users of the water; and
    - (iv) in the case of an enlargement, alteration or repair of an existing dam, a description of the nature and extent of the intended enlargement, alteration or repair;
  - (b) hydrological particulars of the project:
    - (i) The catchment area;
    - (ii) the catchment parameters;
    - (iii) the mean annual precipitation;
    - (iv) the gross and net storage capacity of the reservoir;
    - (v) the surface area of the reservoir at full supply level;
6. (b) (vi) the elevation versus capacity and elevation versus surface area curves for the reservoir;

- 6. (b) (vii) the design flood and the estimated recurrence interval thereof;
- (viii) the regional maximum flood, if applicable, depending on the size of the catchment area; and
- (ix) the safety evaluation flood;
- 6. (c) particulars of the proposed dam and structural stability:
  - (i) Type of wall, with an indication of the quantities of construction material (for example, volume of earthfill, concrete, masonry and rockfill);
  - (ii) the maximum height of the wall;
  - (iii) the base width and crest width at the maximum cross-section;
  - (iv) the slope of the upstream and the downstream sides and nature of slope protection measures;
  - (v) the total crest length of the wall;
  - (vi) a description of the construction materials for use in different zones of the wall, with an indication of their composition, nature and origin;
  - (vii) a description of the general nature and distribution of the materials forming the foundation of the dam;
  - (viii) a description of seepage control measures;
  - (ix) a description of seepage monitoring measures; and
  - (x) a statement of load assumptions, methods of calculation, assumed material properties and design norms used for the stability calculations;
- 6. (d) particulars of hydraulic structures and components:
  - (i) A description of the type of spillway;
  - (ii) the height difference between the spillway crest and the lowest part of the non-overspill crest, excluding camber;
  - (iii) the total freeboard for the dam;
  - (iv) the crest length of the spillway;
  - (v) the relative elevations of the river bed immediately downstream of the structure (that is lowest downstream ground elevation on the outside of the dam wall), spillway crest and non-overspill crest;
  - (vi) the discharge capacity of the spillway with "zero" freeboard;
  - (vii) a description of any type of energy dissipators and their dimensions;
  - (viii) a description of the river diversion works, when applicable;

6. (d) (ix) a description of the outlet works of the dam; and
- (x) the number of days needed to draw down the water level of the reservoir to different depths between full and ten percent of the full water depth with no flow into the reservoir;
- (e) measures to ensure public safety as contemplated in subregulation 11(e).
- (f) particulars relating to the construction of the works:
- (i) Particulars of the quality control to be applied;
- (ii) the planned date of commencement of the construction work;
- (iii) the expected duration of the construction work;
- (iv) the name of the contractor, if known; and
- (v) the name and particulars of the person responsible for supervision during the construction phase, if known; and
- (g) name and qualifications of the person responsible for the design of the project.

#### **Engineering drawings for category I dam**

7. Engineering drawings for a project contemplated in regulation 5 in respect of a Category I dam must show –
- (a) the general locality of the dam, with an indication of access routes from the nearest town;
- (b) the contour plan of the reservoir up to at least one metre above the non-overspill crest height;
- (c) the general layout of the proposed works;
- (d) the typical particulars of the various sections or zones of the wall, including the outlet works, spillway, foundation excavation and treatment, wall and foundation drainage, and special or unusual characteristics;
- (e) in the case of an enlargement, alteration or repair of existing works, particulars of the connection between existing and new works;
- (f) the nature and locality of any development within and adjacent to the flooded area within the reservoir;
- (g) areas in and adjacent to the reservoir where access to the public is restricted;
- (h) the particulars on a plan of suitable scale of the nature and locality of development downstream of the dam in an area that could be threatened during floods or by a failure of the dam; and
- (i) the particulars on a plan of suitable scale of the locality of other dam projects in the catchment area upstream of the proposed works that could influence its safety in the event of an emergency occurring at those dams.

**Safety of existing development affected by category I dam**

8. (1) An evaluation must be carried out if –
- (a) existing development can be submerged or adversely affected by a reservoir formed by the construction, enlargement, repair or alteration of a dam with a safety risk;
  - (b) existing development can be affected by changes in natural flood levels caused by the construction, enlargement, repair or alteration of a dam with a safety risk; or
  - (c) the hydraulic and geometric characteristics of a watercourse can be transformed by the construction, enlargement, alteration or repair of a dam with a safety risk, with the result that there could be a significant increase in the risk of harm to persons, damage to property, or damage to resource quality.
8. (2) The evaluation contemplated in regulation 8(1) must include –
- (a) upstream development, downstream development and river crossings that may be affected by the dam;
  - (b) a detailed description of the existing development or crossings, locality, current use (which includes recreation), and frequency of pedestrians, vehicles, or other type of traffic;
  - (c) an assessment of the hazards that the development and crossings are subjected to during normal use, dry and normal river flow conditions and floods, and the potential loss of life during the various conditions;
  - (d) proposals for the replacement, relocation, or compensation of existing development; and, where applicable
  - (e) proposals for the provision of an alternative safe crossing, or other reasonable access such that anticipated risks to persons, property, animals, or other type of traffic are not higher than the risks at the original crossing prior to the construction, enlargement, alteration or repair of a dam with a safety risk;
8. (3) The evaluation of the safety of existing development as set out in regulation 8(2) must be included in the design report contemplated in regulation 5(b).

**Additional information with regard to design report, engineering drawings and safety of existing development affected by category I dam**

9. Any other information than the information contemplated in regulations 6, 7 and 8 of a project contemplated in regulation 5 must be submitted by the owner when requested by the Director-General.

**Licence application for category II dam**

10. Any person who intends to construct a Category II dam or to enlarge, alter or repair an existing dam so that the completed dam can be classified as a Category II dam, must –
- (a) acquire the services of an approved professional person to design the proposed project and to draw up plans and specifications for it; and
  - (b) apply for a licence to construct, enlarge, alter or repair by submitting to the Director-General:
    - (i) An official application form obtained from the Department and signed by the applicant;
    - (ii) a design report in accordance with regulation 11;
    - (iii) project specifications in accordance with regulation 12;
    - (iv) engineering drawings in accordance with regulation 13; and
    - (v) an evaluation of the safety of existing development that could be affected by the dam in accordance with regulation 8, and which must be included in the design report.

**Design report for category II dam**

11. A design report contemplated in regulation 10 for a Category II dam must be compiled by the approved professional person and must include the following information:
- (a) General particulars of the project:
    - (i) The name and address of the owner of the dam and that of the person in control;
    - (ii) the locality of the dam including a description as contained in the title deed of the property concerned, magisterial district, nearest town, the distance to the nearest town, the name of the river or watercourse wherein situated (if any), the location in terms of latitude and longitude (to the nearest second of accuracy) and the water management area;
    - (iii) the purpose of the scheme, the water use and the users of the water;
    - (iv) the type of wall, with an indication of the quantities of construction material (for example, volume of earthfill, concrete, masonry and rockfill); and
    - (v) in the case of an enlargement, alteration or repair of an existing dam, a description of the nature and extent of the intended alteration, enlargement or repair;



**11. (b)** hydrological particulars of the project:

- (i) The catchment area;
- (ii) the catchment parameters;
- (iii) the mean annual precipitation;
- (iv) the gross and net storage capacity of the reservoir;
- (v) the surface area of the reservoir at full supply level;
- (vi) the elevation versus capacity and elevation versus surface area curves;
- (vii) the hydrological methods used;
- (viii) the design flood and the estimated recurrence interval thereof;
- (ix) the regional maximum flood, if applicable, depending on the size of the catchment area;
- (x) the safety evaluation flood and the estimated recurrence interval thereof;
- (xi) particulars of the design and safety evaluation flood hydrographs, indicating the criteria, data source and methods used for their determination; and
- (xii) inflow and outflow hydrographs for design flood and safety evaluation flood conditions when significant attenuation of a flood entering the reservoir is expected, with a full motivation for selection of attenuated floods;

**11. (c)** particulars of the hydraulic structures and components:

- (i) The type of spillway and its dimensions;
- (ii) the amount of dry freeboard (that is the vertical difference between the design flood level and the non-overspill crest);
- (iii) the relative elevations of the river bed immediately downstream from the structure (that is the lowest downstream ground elevation on the outside of the dam wall), spillway crest and non-overspill crest;
- (iv) the discharge capacity of the spillway with "zero" freeboard;
- (v) a description of any spillway gates and associated equipment;
- (vi) the operating rules for the spillway gates;
- (vii) the identification of any type of energy dissipators and their dimensions;
- (viii) a description of the flood-handling procedure, indicating the criteria and methods used to determine the dimensions of the spillways, energy dissipators and river diversion works, when applicable;

11. (c) (ix) the tailwater level during the design flood;
- (x) a description of the auxiliary spillway and its function, when applicable;
- (xi) a description of the outlet works; and
- (xii) the number of days needed to draw down the water level of the reservoir to different depths between full and ten per cent of the full water depth with no flow into the reservoir;
11. (d) structural design and stability of the dam, ancillary structures and foundations:
- (i) the maximum height of the wall;
- (ii) the base width and crest width at the maximum cross-section;
- (iii) the upstream and downstream slope;
- (iv) the total crest length of the wall;
- (v) a general engineering description of the construction materials, including the parameters used in the design of the different zones of the wall, with an indication of their source (that is borrow areas), composition, nature, grading and geological origin;
- (vi) design assumptions, design parameters, load combinations, methods of calculation, assumed material properties and design norms;
- (vii) geological maps and profiles with a description of the general geology of the dam site and the classification of foundation materials to indicate their engineering geological characteristics, including the parameters used in the design, geological composition, type, origin and distribution;
- (viii) a risk analysis on the dam, ancillary structures and foundations with an indication of probabilities of failure, **when requested by the Director-General;** and
- (ix) a dam safety risk assessment, **when requested by the Director-General;**
11. (e) precautions and measures to ensure public safety:
- (i) the designation of restricted areas (for example, the dam wall (or certain portions thereof), the entrance to the spillway, the spillway, spillway return channel, energy dissipators, plunge pool, outlet works, any other ancillary structures on or near the dam, a specified zone of the reservoir upstream of the dam wall between the left bank and right bank, a specified zone of the river downstream of the dam between left bank and right bank);
- (ii) the provision of a floating safety boom upstream of the spillway, where applicable;
- (iii) the provision of safe access within designated areas of the dam wall or ancillary structures;

11. (e) (iv) when applicable, the provision of parapet walls, handrails, guard rails, fences or vehicle barriers;
- (v) the provision of appropriate warning signs at the dam wall and ancillary structures; and
- (vi) the provision of appropriate warning signs related to the use of the reservoir for recreational purposes, at or nearby the dam wall, when required by the Director-General.

**Project specifications for category II dam**

12. Project specifications for a Category II dam must be compiled for the construction of the dam and related structures, wherein the following is specified:
- (a) The requirements with which construction and foundation materials must comply;
- (b) the procedures that must be followed for the construction of the dam and the equipment to be used;
- (c) the permissible tolerances for the finishing of structural parts; and
- (d) the particulars of quality control to be applied.

**Engineering drawings for category II dam**

13. Engineering drawings for a project contemplated in regulation 10 in respect of a Category II dam must show –
- (a) the general locality of the dam, with an indication of access routes from the nearest town;
- (b) the contour plan of the reservoir up to at least one metre above the non-overspill crest height;
- (c) the general layout of the proposed works;
- (d) the typical particulars of the dam, including the wall, outlet works, spillways, foundation excavation and treatment, wall and foundation drainage, joint grouting, instrumentation and special or unusual characteristics;
- (e) in the case of the enlargement, alteration or repair of existing works, particulars of the connection between existing and new works;
- (f) the particulars of river diversion works, where applicable;
- (g) the nature and locality of any development within and adjacent to the flooded area of the reservoir as well as areas where access to the public is restricted;
- (h) the particulars on a plan of suitable scale of the nature and locality of infrastructure and development downstream of the dam in an area that could be threatened during floods or by a failure of the dam; and
- (i) the particulars on a plan of suitable scale of the locality of other dam projects in the catchment area upstream of the proposed works that could influence its safety in the event of an emergency occurring at one or more of the upstream projects.

**Safety of existing development affected by category II dam**

14. An evaluation of the safety of existing development as set out in regulation 8 must be included in the design report contemplated in regulation 10.

**Additional information related to design report, project specifications, engineering drawings and safety of existing development affected by category II dam**

15. Any other information than the information contemplated in regulations 11, 12, 13 and 14 for a project contemplated in regulation 10 must be submitted by the owner when requested by the Director-General.

**Professional team and independent experts for category III dam**

16. (1) Any person who intends to construct a Category III dam or to enlarge, alter or repair an existing dam so that the completed dam will be classified as a Category III dam, must obtain the services of an approved professional person, assisted by a professional team, to design the proposed project and to draw up plans and specifications for it.
16. (2) If the Director-General is of the opinion that –
- (a) a project is an extraordinarily large one;
  - (b) unusual design principles or methods of analysis have been used;
  - (c) unusual construction procedures or construction materials have been specified; or
  - (d) there are extraordinary circumstances;
- he or she may require that the owner or person in control in respect of the proposed project appoint an independent expert or team of experts to evaluate the proposed design, drawings, specifications, anticipated circumstances during construction of the dam or first filling of the reservoir, in whole or in part or any aspect thereof, and submit a report on its findings to the Director-General.
16. (3) The appointment of experts in terms of subregulation 16(2) must be approved by the Director-General beforehand, and for this purpose particulars of the qualifications and experience of the experts must be submitted to the Director-General.
16. (4) Any change in the membership or composition of a professional team or independent team of experts contemplated in subregulation 16(2) must be submitted to the Director-General for approval.

**Licence application for category III dam**

17. Any person who intends to construct a Category III dam, or to enlarge, alter or repair an existing dam so that the completed dam will be classified as a Category III dam, must apply for a licence by submitting to the Director-General:
- (a) An official application form obtained from the Department and signed by the applicant;
  - (b) a design report in accordance with regulation 18;
  - (c) project specifications in accordance with regulation 19;
  - (d) engineering drawings in accordance with regulation 20; and
  - (e) an evaluation of the safety of existing development that could be affected by the dam in accordance with regulation 8, and which must be included in the design report.

**Design report for category III dam**

18. A design report contemplated in regulation 17 for a Category III dam must contain the information set out in regulation 11 and include –
- (a) an evaluation of the reliability and acceptability of the hydrological data used for the design of the spillway and river diversion;
  - (b) the results of the proposed flood handling procedure applied to various alternative inflow hydrographs;
  - (c) the calculated or model study results to demonstrate the hydraulic characteristics of the spillways and energy dissipators;
  - (d) the results of backwater curve calculations upstream of the dam wall, when requested by the Director-General;
  - (e) an evaluation of the expected rate of silting and its influence on the characteristics of flood hydrographs and backwater curves along and upstream of the reservoir, when requested by the Director-General;
  - (f) the hydraulic aspects of the river diversion works;
  - (g) the discharge curves for outlets that could be used to lower the water level in the reservoir;
  - (h) geological maps and profiles with a description and evaluation, based on tests performed on samples or *in situ* tests, of the distribution and engineering-geological characteristics of foundation materials and geological discontinuities that could have an effect on the dam wall;
  - (i) an evaluation of the stability of natural slopes in and in the immediate proximity of the reservoir based on a geological map with information on the distribution and characteristics of geological materials and discontinuities;

18. (j) an evaluation of the potential for induced seismicity by the reservoir and natural seismicity at sources within a radius that could have an impact on the dam based on a geological map with information on the distribution and characteristics of geological materials and discontinuities, and particulars of any historical earthquakes which had a significant effect at the dam site;
- (k) a description of the scope of the materials investigations for the dam and foundations and results obtained;
- (l) the results of structural and stability analyses of the dam and foundations, including safety factors, stresses and displacements;
- (m) risk analyses on the dam, ancillary structures and foundations with an indication of probabilities of failure, when requested by the Director-General;
- (n) a dam safety risk assessment, when requested by the Director-General; and
- (o) a discussion of the objectives and design principles of the monitoring equipment and instrumentation layout.

**Project specifications for category III dam**

19. Project specifications for a Category III dam must be compiled for the construction of the dam and related structures that include the particulars set out in regulation 12.

**Engineering drawings for category III dam**

20. Engineering drawings for a project contemplated in regulation 17 in respect of a Category III dam must show the particulars set out in regulation 13.

**Safety of existing development affected by category III dam**

21. An evaluation of the safety of existing development as set out in regulation 8 must be included in the design report contemplated in regulation 18.

**Additional information related to design report, project specifications, engineering drawings and safety of existing development affected by category III dam**

22. Any other information than the information contemplated in regulations 18, 19, 20 and 21 for a project contemplated in regulation 17 must be submitted by the owner when requested by the Director-General.

**Conditions and requirements of licence to construct, enlarge, alter or repair dam with safety risk**

23. (1) The following conditions and requirements that the holder of a licence to construct, enlarge, alter or repair a dam with a safety risk must comply with, must be specified in a licence for a Category I dam:
- (a) A deviation from the expected condition of the foundation, or the expected quality of construction materials that comes to light during the construction phase, must be reported to the Director-General without delay;

23. (1) (b) any deviation from the design must be reported to the Director-General without delay;
- (c) any design adjustment that the Director-General may deem to be reasonably necessary on the grounds of new information becoming available, must be executed and effected meticulously and without delay;
- (d) any information in connection with the construction work that is required by the Director-General must be supplied to him or her without delay; and
- (e) assistance must be given to the Director-General or any person instructed by him or her, to conduct an investigation or obtain information or carry out inspections without delay that the Director-General or that person may deem to be reasonably necessary in connection with the evaluation of the safety of the dam during construction.
23. (2) The following conditions and requirements with which the holder of a licence referred to in subregulation 23(1) must comply, must in addition to the conditions and requirements determined in that subregulation, be specified in a licence in respect of a Category II dam:
- (a) In the case of any changes from the design principles set out in the design report submitted in accordance with regulation 11, project specifications submitted in accordance with regulation 12, or change of typical particulars that appear on engineering drawings submitted in accordance with regulation 13, the Director-General must be advised in the form of a written report dealing with the nature, extent and implications of the changes;
- (b) the report contemplated in subregulation 23(2)(a) must be compiled by the approved professional person and submitted to the Director-General at least 30 days before the changes are implemented; and
- (c) where the changes contemplated in subregulation 23(2)(a) are made to deal with an emergency situation, the approved professional person must report them to the Director-General within seven days, followed by the submission of a written report on the changes;
- (d) an approved professional person must be appointed –
- (i) to monitor construction and to see to it that adequate measures are taken to ensure that the provisions of the design drawings and specifications are complied with;
- (ii) to ensure that an up to date set of "as built" drawings on which all alterations are shown is compiled;
- (iii) to ensure that up to date information on the construction of the dam, including foundation treatment, is kept and to compile a construction completion report; and
- (iv) to issue a completion certificate;

23. (2) (e) where an existing dam is enlarged, altered or repaired, a maximum controlled water-level determined by the Director-General must not be exceeded before a licence to impound water contemplated in regulation 24 has been issued;
- (f) in the case of a new dam, the river diversion works, outlet works or similar structure may not be closed before a licence to impound water has been issued;
- (g) copies of the completion certificate, the "as built" drawings and specifications, and the construction completion report must be submitted to the Director-General within 120 days after the date of the completion certificate;
- (h) if the approved professional person is no longer able to carry out his or her duties, the Director-General must be notified thereof within 14 days, and steps must be taken to replace that person; and
- (i) if so required by the Director-General, the approved professional person must have an approved alternate to take over his or her duties if he or she is not able to carry them out.
23. (3) The following conditions and requirements that the holder of a licence referred to in subregulation 23(1) must comply with, must in addition to the conditions and requirements determined in that regulation and in subregulations 23(1) and 23(2), be specified in the licence in respect of a Category III dam:
- (a) Reports on the quality control of the construction work and progress reports be submitted to the Director-General by the approved professional person at times specified by the Director-General;
- (b) in cases where the Director-General is reasonably of the opinion that it is justified, construction work on a part of the project may not begin before information or particulars requested by the Director-General are submitted to the Director-General, and these requirements have been complied with;
- (c) the approved professional person must keep a record of geological conditions as exposed by excavations or drilling work during construction of the dam, in order to identify deviations from assumed conditions and to compile information on true "as built" foundation conditions; and
- (d) the approved professional person must have an alternate approved by the Director-General to take over his or her duties if he or she is unable to carry them out.

#### **Licence to impound water in dam with safety risk**

24. (1) No licence to impound water is required for a Category I dam.
- (2) Any person who constructs a new dam which will on completion be classified as a Category II or III dam, may not close the river diversion works, outlet works or similar structure, before he or she is in possession of a licence to impound water.



24. (3) Any person who enlarges, alters or repairs an existing dam so that it will thereafter be classified as a Category II or III dam, may not allow the water level in the reservoir to rise above the maximum controlled level determined in the licence to construct, enlarge, alter or repair before he or she is in possession of a licence to impound water.

**Application for licence to impound water in dam with safety risk**

25. (1) An application for a licence to impound water must be submitted to the Director-General at least 60 days before the planned date for closure of the river diversion works or outlet works, where applicable, and must include –
- (a) an official application form of the Department that has been completed and signed by the owner, person in control of the dam or approved professional person;
  - (b) the particulars set out in regulation 26;
  - (c) an operation and maintenance manual that has been compiled and signed by an approved professional person;
  - (d) an emergency preparedness plan that has been compiled and signed by an approved professional person;
  - (e) an affidavit by the owner stating that all residential areas and buildings frequented by people in the dam basin have been vacated; and
  - (f) in cases where induced seismicity is expected, proof that the owner has instituted an awareness program to prepare persons in the vicinity of the dam for any associated events.
- (2) The approved professional person must consider whether a combined operation and maintenance manual and emergency preparedness plan, or a separate operation and maintenance manual and emergency preparedness plan is the most effective for operation, maintenance as well as disaster management related to the dam and the downstream area threatened by failure of the dam.

**Licence application to impound water in category II dam**

26. Any person who constructs, alters, enlarges or repairs a Category II dam must subject to regulation 25 apply to the Director-General for a licence to impound water by supplying the following particulars and documents:
- (a) The name and address of –
    - (i) the owner and person in control of the dam;
    - (ii) the representative of the owner or person who has been granted authority to issue instructions in connection with the operation of the dam;
    - (iii) the person directly responsible for the day-to-day operation of the dam;
    - (iv) the person responsible for the taking of monitoring instrument readings at the dam;

26. (a) (v) the person responsible for the regular evaluation of the monitoring instrument readings contemplated in subparagraph 26(a)(iv); and
- (vi) the person responsible for routine inspections of the dam that must be carried out in accordance with the operation and maintenance manual;
- (b) the name and address of –
- (i) the provincial disaster management office;
- (ii) where applicable, the district, municipal, or designated disaster management authority or office with whom arrangements have been made in connection with the issue of warnings, and who is responsible for evacuation should a condition that affects the safety of the dam arise;
- (iii) the South African Police Services station nearest to the dam; and
- (iv) representatives of local authorities, representative bodies, or of any communities potentially threatened by the presence of the dam and with whom arrangements have been made in connection with the issue of warnings should a condition that affects the safety of the dam arise;
- (c) the methods that will be used to issue warnings timeously to the areas downstream of the dam if a condition affecting the safety of the dam arises;
- (d) information on existing road, air, telephone, cellular telephone, radio, facsimile, electronic and any other communication links with the dam;
- (e) information on slipways for boats around the reservoir;
- (f) a construction progress report with an indication of work that has not yet been completed;
- (g) a control programme for the first filling period and the assumptions on which it is based; and
- (h) the planned date on which the river diversion works or outlet works, where applicable, will be closed.

**Operation and maintenance manual for category II dam**

27. An operation and maintenance manual for the dam must include the names and addresses set out in regulation 26(a), and must include –
- (a) a description of the project and a concise description of the dam;
- (b) detailed information, including the catchment area and a description of the downstream development, as well as –
- (i) basic flood hydrological data;
- (ii) elevation versus capacity and elevation versus surface area curves for the reservoir;

27. (b) (iii) spillway and outlet discharge tables (or curves) for the dam;
- (c) a site plan of the project showing the reservoir, dam, and access routes to the dam;
- (d) a small scale map of the upstream and downstream river reach that would be affected in times of flood, which –
- (i) provides an overview of the river for the purpose of disaster management or operation of the dam during floods;
  - (ii) indicates developments within close proximity of the reservoir including resorts, picnic spots and hiking trails; and
  - (iii) is not necessarily the same as detailed inundation maps required for an emergency preparedness plan;
- (e) a set of engineering drawings of the general layout of the dam and basic details of outlet works and spillway gates, where applicable;
- (f) plans, elevations, and sections that show characteristic features of the dam to indicate important operating particulars, including the locality of control points, monitoring instruments, access routes to the dam that could be used during floods, slipways for boats for rescue operations and areas where access to the public is restricted;
- (g) instructions for the maintenance of the civil components of the dam, including drainage systems, slope protection, hydraulic structures and other parts requiring maintenance;
- (h) instructions for the operation and maintenance of the mechanical and electrical components of the dam that are used for the control of floodwater or that could be used in an emergency to lower the water-level of the reservoir;
- (i) particulars of a regular inspection programme to check the condition and the serviceability of the various components of the dam, including an item list to serve as a guideline for inspections;
- (j) information on the layout, reading procedure and reading frequency of monitoring instruments, and particulars on the procedure for the processing and assessment of monitoring instrument readings, including guideline values for the assessment of monitoring instrument readings;
- (k) any limitations on the rate of releases or changes in the water-level of the reservoir;
- (l) in the case of a dam with an uncontrolled spillway particulars on flood warning systems for incoming and outgoing floods, water-levels and water-level changes;
- (m) in the case of a dam with a controlled spillway, or a dam equipped with floodgates, particulars of –
- (i) the gate operating rules, operational systems and required personnel;
  - (ii) the limits on water levels, water level changes and rate of releases;

27. (m) (iii) the warning systems to alert the dam operator of floods or flow releases;
- (iv) the warning systems to alert persons downstream of the dam of floods or flow releases;
- (v) the measures to be implemented when one or more floodgates cannot be opened;
- (vi) the alternative power supply in the event of a power failure;
- (vii) the measures to remove and prevent obstructions caused by floating objects such as boats, jetties, trees, logs and other debris; and
- (viii) the security measures to prevent unauthorised persons access to the dam, critical parts of the dam or appurtenant works;
- (n) particulars on recording of observations and incidents, issuing of communications and instructions, filing and dispatching of reports, log book entries and recording deviations from an operating rule that relate to prevailing conditions when floods are released in a controlled or uncontrolled manner;
- (o) descriptions of circumstances at the dam that should be considered a condition affecting the safety of the dam, together with guidelines for the evaluation of conditions and procedures and actions to be followed to limit the impact of these circumstances on the works and downstream areas; and
- (p) precautions or measures to ensure public safety as contemplated in subregulation 11(e).

#### **Emergency preparedness plan for category II dam**

28. An emergency preparedness plan must include applicable names and addresses set out in subregulation 26(a) and 26(b), as well as the following particulars:
- (a) Detailed information describing the dam, its catchment area and downstream development, as well as –
- (i) basic flood hydrological data;
- (ii) elevation versus capacity and elevation versus surface area curves for the reservoir;
- (iii) spillway and outlet discharge tables (or curves) for the dam; and
- (iv) a set of engineering drawings of the general layout of the dam and basic details of outlet works, sluices and spillway gates, where applicable;
- (b) descriptions of circumstances at the dam that should be considered a condition affecting the safety of the dam, together with guidelines for the evaluation of such a condition and procedures and actions to be followed;
- (c) a notification flowchart that shows who is to be notified, by whom, and in what priority, to enable timely notification of persons and organisations who are responsible for taking emergency actions;

28. (d) a description of the responsibilities of the owner for developing, implementing, maintaining and updating the emergency preparedness plan;
- (e) a clear statement that the emergency preparedness plan compiled in terms of these Regulations is not an emergency evacuation plan, and –
- (i) where applicable, a statement that the designated disaster management authority or office, is responsible for warning and evacuation within affected areas; or
- (ii) if no formal disaster management structure exists, the name and address of the person who will be responsible for the evacuation of people and animals;
- (f) a description of preparedness actions to limit or alleviate the effects of a dam failure, operational spillway release, or to deal with the effects of seismicity where this is deemed to be reasonably necessary by the Director-General or approved professional person, and to facilitate response to emergencies;
- (g) identification of historical flood marks in built up areas; and
- (h) inundation maps delineating areas downstream of the dam that would be flooded as a result of a dam failure, and where deemed to be reasonably necessary by the approved professional person, areas flooded by selected small, medium, large or major natural floods.

#### **Licence application to impound water in category III dam**

29. Any person who constructs a Category III dam or enlarges, alters or repairs an existing dam so that it can be classified as a Category III dam must –
- (a) apply to the Director-General for a licence to impound water by submitting the particulars and documents prescribed in respect of a Category II dam in regulations 25 and 26; and
- (b) submit an operation and maintenance manual contemplated in regulation 27 and an emergency preparedness plan contemplated in regulation 28 to the Director-General.

#### **Operation and maintenance manual and emergency preparedness plan for category III dam**

30. An operation and maintenance manual and an emergency preparedness plan contemplated in regulation 29(b) must be drawn up by an approved professional person assisted by a professional team.

#### **Conditions and requirements of licence to impound water**

31. The following are conditions and requirements that the holder of a licence to impound water referred to in regulation 24(2) and 24(3) must comply with must be specified in a licence to impound water:
- (a) The Director-General must be notified in writing within 30 days of any change in the names and addresses furnished in terms of regulation 26(a) and 26(b);

31. (b) instructions and procedures in the operation and maintenance manual and emergency preparedness plan submitted in terms of regulations 27 and 28 must be complied with;
- (c) the requirements of regulation 32(1), (2), (3) and (4) in so far as they apply to the dam, must be complied with;
- (d) the owner or person in control must notify the Director-General without delay as soon as a condition affecting the safety of a dam is identified;
- (e) a written report on the nature, extent and causes of the condition and the steps that have been taken to improve the safety of the dam, must be submitted to the Director-General within 30 days of the condition affecting the safety of the dam;
- (f) if, the Director-General, on reasonable grounds of the opinion that the circumstances of a particular project require it, the controlled water-level in the reservoir must not exceed a height determined by him or her; and
- (g) any condition related to the structural safety (or stability) of the dam which the Director-General deems necessary to reduce the risk of potential loss of life, to reduce the risk of damage to property, to reduce the risk of an adverse effect on resource quality or damage to the environment.

**Conditions and requirements regarding operation and maintenance of dam with safety risk**

32. (1) The Director-General may –
- (a) inspect any dam with a safety risk or test any component thereof;
- (b) direct the owner or person in control of the dam to have an inspection or test carried out or to have instruments for monitoring the behaviour of the dam installed;
- (c) direct the owner or person in control to provide information in a prescribed form on any matter affecting the safety of the dam or the protection of life, property and resource quality related to the existence of the dam;
- (d) require that maintenance work and dam safety betterment work, which according to a dam safety evaluation report are found to be necessary, be carried out under the supervision of an approved professional person;
- (e) in consequence of a dam safety evaluation, require that further studies or investigations be undertaken by an approved professional person to investigate any potential defects; and
- (f) determine a time for the submission of information or the taking of steps in terms of sub paragraphs 32(b), 32(c) and 32(e);
- (2) The owner or person in control of a Category II or III dam must appoint an approved professional person to compile an operation and maintenance manual and emergency preparedness plan in accordance with regulations 27 and 28 and submit a copy to the Director-General when requested by him or her.

32. (3) In respect of a Category III dam the approved professional person contemplated in subregulation 32(2) must be assisted by a professional team.
- (4) The operation and maintenance manual and emergency preparedness plan contemplated in subregulation 32(2) must be kept up to date by the owner or person in control of the dam.
- (5) The owner or person in control of a dam with a safety risk must –
- (a) regularly inspect the dam or have it inspected, using the guidelines for routine inspections described in the operation and maintenance manual, to check whether all the components of the dam are in a satisfactory serviceable condition and are capable of performing the function for which they are intended;
  - (b) as soon as a condition affecting the safety of a dam arises at the dam, investigate, or cause to be investigated and evaluate the circumstances and without delay take steps that are necessary to clear up or control the condition using the guidelines in the emergency preparedness plan.
  - (c) In the case of a Category II dam or Category III dam the nature of the steps contemplated in subregulation 32(5)(b), as well as a programme for the implementation thereof, must be reported in writing to the Director-General within 60 days after the development of a condition;
  - (d) when an emergency develops at the dam, immediately release information in accordance with the emergency preparedness plan to make it possible to evacuate threatened areas downstream of the wall;
  - (e) report to the Director-General any emergencies that may develop at the dam without delay, and carry out any instructions arising therefrom, and must within a period of 30 days provide the Director-General with a written report containing full details of the circumstances giving rise to the emergency, of how the conditions developed or were controlled and of the nature and extent of the damage;
  - (f) apply appropriate operational procedures to prevent people or property downstream of the dam from being flooded without warning by sudden changes in water-levels; and
  - (g) furnish full co-operation and assistance in any investigation or inspection of any component of the dam being carried out at the direction of the Director-General.

**Keeping of records, storage of documents, change of ownership and change of use of dam with safety risk**

33. (1) The owner or person in control of a dam with a safety risk must keep detailed and up to date records of the dam, which must include –
- (a) the operation and maintenance manual and emergency preparedness plan for the dam;
  - (b) dam safety evaluation and investigation reports on the dam;

33. (1) (c) drawings of the dam and any reports on the geology, design, construction, maintenance, operation and improvements or changes to the dam;
- (d) in the case of a Category II or Category III dam equipped with monitoring instruments, instrumentation observation data, and tables and graphs, that are kept continuously up to date to illustrate the data collected;
- (e) in the case of a Category II or Category III dam, information regarding fluctuation of water levels in the reservoir and flow in the river downstream of the dam wall, as requested by the Director-General in each particular instance.
- (2) The original records referred to in subregulation 33(1) above, or usable copies thereof, must be stored at the dam site or in a nearby office where they can be inspected and be protected against any damage.
- (3) When ownership or control of a dam with a safety risk is transferred to another person the owner of the dam must –
- (a) transfer the records of the dam to the new owner or person in control of the dam, within 60 days of the change of ownership of the dam;
- (b) notify the Director-General in writing, and within 60 days after the change of ownership of the dam, of the change in ownership and that the records have been transferred to the new owner or person in control of the dam; and
- (c) submit the name and address of the new owner or person in control of the dam to the Director-General.
- (4) If a dam with a safety risk is unusable owing to silting up or for any other reason, the owner of the dam must notify the Director-General in writing thereof within 60 days after such an occurrence.
- (5) If a dam with a safety risk is to be used for any purpose other than that for which it was originally constructed, the owner or other person in control of the dam must notify the Director-General in writing thereof at least 60 days before any change comes into effect.

#### **Dam safety evaluation for category I dam**

34. (1) The owner or person in control of a Category I dam must –
- (a) submit, at his or her cost, an evaluation report on the safety of the dam when requested to do so by the Director-General, and within a period specified by the Director-General, in accordance with subregulations 34(2) and 34(3); and
- (b) submit further dam safety evaluation reports at intervals of between five and ten years when requested by the Director-General.
- (2) Dam safety evaluation reports for Category I dams must include the following information:
- (a) A description of the project of which the dam is part;



34. (2) (b) details of the dam, including –
- (i) the type of wall;
  - (ii) the maximum height of the wall;
  - (iii) the storage capacity of the reservoir;
  - (iv) the surface area of the reservoir at full supply level;
  - (v) the total crest length of the wall;
  - (vi) the crest width of the wall;
  - (vii) the upstream and downstream slopes of the wall;
  - (viii) a description of the materials in different zones of the wall, including slope protection measures, where applicable;
  - (ix) a description of the general nature and distribution of materials forming the foundation of the dam;
  - (x) a description of drainage and seepage control measures;
  - (xi) a description of the outlet works of the dam; and
  - (xii) the completion date of the construction of the dam;
- (c) hydrological particulars and flood estimates, including –
- (i) the catchment area;
  - (ii) the catchment parameters;
  - (iii) the mean annual precipitation;
  - (iv) the methods used for flood estimates;
  - (v) the design flood and the estimated recurrence interval thereof;
  - (vi) the regional maximum flood, if applicable, depending on the size of the catchment area;
  - (vii) the safety evaluation flood and the estimated recurrence interval thereof; and
  - (viii) the guidelines used for the choice of alternative floods used to evaluate the adequacy of the spillway;
- (d) a description and evaluation of the spillway, including –
- (i) the type of spillway;
  - (ii) the crest length of the spillway;

34. (2) (d) (iii) the height difference between the spillway crest and lowest level of the non-overspill crest;
- (iv) the dimensions of all possible hydraulic control sections;
- (v) the length of the spillway return channel, if applicable;
- (vi) the maximum discharge capacity of the spillway with "zero" freeboard;
- (vii) the freeboard during the design flood; and
- (viii) the expected damage or erosion during various floods;
- (e) an evaluation of the safety, structural stability, operating procedures and the maintenance of the dam based on the inspection carried out in accordance with regulation 34(3);
- (f) the name of the designer of the dam and contractor;
- (g) the remedial works since completion of the dam;
- (h) the major problems, which occurred previously;
- (i) a description of the observations and findings made during the on-site inspection carried out in accordance with subregulation 34(3);
- (j) a failure modes and effects analysis (FMEA), when requested by the Director-General;
- (k) a site plan of the project;
- (l) the plans, elevations and sections that show characteristic features of the dam and spillway; and
- (m) an appropriate number of colour photographs that reflect the observations made during the on-site inspection.
- (3) An on-site inspection for a Category I dam must be carried out by the owner of the dam, or person appointed by the owner, where note is taken of –
- (a) the general condition of the crest, upstream face and downstream face of the dam wall (for example, presence and size of trees, erosion gullies and other irregularities);
- (b) the position and size of any wet patches or leakages through the wall or foundation thereof, mentioning the turbidity and flow rate of any leaking water;
- (c) the position and extent of any cracks, subsidences, bulges or signs of relative movement on any part of the dam wall;

34. (3) (d) the position and size of holes or nests made by burrowing animals, rodents or insects (for example, aardvark, moles, meercats, rats, crabs, termites and ants);
- (e) the condition of the spillway, including any erosion thereof in the area directly upstream or downstream of the spillway;
- (f) the condition and serviceability of the outlet works of the dam;
- (g) the effectiveness of precautions and measures to ensure public safety as contemplated in subregulation 11(e).
- (h) any buildings or developed areas downstream of the wall that could be threatened by floodwater due to failure of the dam;
- (i) any adverse impact on resource quality as a result of failure of the dam; and
- (j) any other aspect related to the safety of the dam or hazard potential due to the existence of the dam.

#### **Dam safety evaluation for category II dam**

35. (1) The owner or person in control of a Category II must have –
- (a) a dam safety evaluation of the dam carried out at his or her expense when requested to do so, and within the period specified by the Director-General; and
- (b) further dam safety evaluations carried out at intervals of between five and ten years when requested by the Director-General.
35. (2) A dam safety evaluation of a Category II dam must be carried out by an approved professional person to identify any actual or potential shortcomings in the condition of the dam or in the quality and adequacy of the procedures followed for the maintenance, operation and monitoring of behaviour that might endanger human lives, damage of property, or have an adverse impact on resource quality.
35. (3) A report on the dam safety evaluation must be compiled by the approved professional person and submitted to the Director-General within the period that he or she may determine.
35. (4) A dam safety evaluation by an approved professional person referred to in subregulation 35(2) must include the following:
- (a) A study of all existing reports on the design, construction and safety of the dam and related matters;
- (b) an on-site inspection during which –
- (i) available data on the condition and structural behaviour of the dam and its foundations are inspected and assessed;

35. (4) (b) (ii) note is taken of any visible signs of subsidence, movement, cracking, internal stress, erosion, sink-holes, seepage, leakage, ageing of materials, the functioning of drainage and pressure relief systems, extent and height of vegetation, presence and size of trees and anything else that may affect the safety of the dam;
- (iii) the serviceability of equipment used to regulate floodwater or reservoir water levels and to draw down the water-level quickly in an emergency is investigated; and
- (iv) note is taken of the level of supervision, keeping of records required in accordance with the operation and maintenance manual, operating rules, warning systems, and the security measures at the dam;
- (c) an assessment of the geological conditions on site and of the stability of slopes near the dam and around the reservoir rim;
- (d) an evaluation, based on available information, of –
- (i) the adequacy of the spillway and floodgates, if applicable, including the possibility that one or more floodgates cannot be opened or the possibility that flow may be obstructed by floating objects, such as, boats, jetties, trees, logs and debris;
- (ii) the consequences of overtopping of the non-overspill crest;
- (iii) the potential loss of life, potential economic loss, and damage to resource quality as a result of a failure of the dam;
- (iv) the structural adequacy and stability of structures under the effect of normal and abnormal load conditions;
- (v) applicable hydrological data collected since the dam was constructed or since any previous dam safety evaluation in terms of these Regulations or any regulation made in terms of a law repealed by the Act;
- (vi) the behaviour of the dam, with due consideration of the available monitoring instrument observations or data;
- (vii) the quality and adequacy of the level of operation and maintenance, monitoring programme, and emergency procedures to reduce the potential for harm to human lives, damage to property or to resource quality; and
- (viii) precautions to safeguard members of the public who gain free access to the dam and appurtenant works against accidents, including the adequacy of a floating safety boom upstream of the spillway, where applicable.
- (e) where applicable and in the case of dams equipped with floodgates, an evaluation of the adequacy of –
- (i) the security measures to prevent unauthorised persons access to the dam, critical parts of the dam or appurtenant works;

35. (4) (e) (ii) the warning systems to alert the dam operator of incoming floods;
- (iii) the warning systems to warn persons downstream of the dam of floods or flow releases;
- (iv) the gate operating rules, operational systems and personnel;
- (v) the alternative power supply in the event of a power failure; and
- (vi) the structural adequacy of all elements of the floodgates.
- (f) an evaluation of the safety of existing development upstream and downstream of the dam wall as set out in regulations 8(1) and 8(2).
- (5) (a) A approved professional person, when carrying out a dam safety evaluation must compile a diagram, sketch or drawing showing actual surveyed levels at appropriate intervals along the non-overspill crest of the dam and the crest of the spillway to verify the total freeboard of the dam.
- (b) If the spillway of a dam is an excavated channel where the full supply level is not well defined, several lines of levels must be shown.
- (c) A approved professional person, when carrying out a dam safety evaluation must ensure that level determinations are carried out for the dam safety evaluation for which he or she has been approved, and sign the diagram, sketch or drawing.
- (6) A dam safety evaluation report submitted in respect of a dam in terms of these Regulations must contain the following information:
- (a) A concise description of the project of which the dam is part;
- (b) a site plan of the project;
- (c) the plans, elevations and sections that show the characteristic features of the dam and the position of any monitoring instruments, as well as a diagram, sketch or drawing contemplated in subregulations 35(5)(a) and 35(5)(c);
- (d) a summary of the design assumptions, design analyses, design flood data and safety factors used during the design phase to evaluate the structural adequacy and stability of the dam;
- (e) hydrological particulars of the project, including –
- (i) the catchment area;
- (ii) the catchment parameters;
- (iii) the mean annual precipitation;
- (iv) the gross and net storage capacity of the reservoir;
- (v) the surface area of the reservoir at full supply level;

35. (6) (e) (vi) the elevation versus capacity and elevation versus surface area curves;
- (vii) the design flood and the estimated recurrence interval thereof, assuming that the existing dam is being designed as a "new dam";
- (viii) the regional maximum flood, if applicable, depending on the size of the catchment area;
- (ix) the safety evaluation flood and the estimated recurrence interval thereof;
- (x) particulars of the design flood hydrograph, indicating the criteria, data source and methods used to determine the floods;
- (xi) particulars of a flood hydrograph, that when routed through the reservoir, would be attenuated in a manner that the outflow hydrograph flood peak is the same value as the maximum discharge capacity of the spillway; and
- (xii) inflow and outflow hydrographs for design flood and safety evaluation flood conditions when significant attenuation of a flood entering the reservoir is expected, with a full motivation for the selection of attenuated floods.
- (f) a description and evaluation of the spillway, including –
- (i) the type of spillway;
- (ii) the crest length of the spillway;
- (iii) the height difference between the spillway crest and lowest level of the non-overspill crest;
- (iv) the dimensions of all possible hydraulic control sections;
- (v) the length of the spillway return channel, if applicable;
- (vi) the maximum capacity of the spillway;
- (vii) the freeboard during the design flood; and
- (viii) the expected damage or erosion during various floods;
- (g) a summary of the geological and geotechnical conditions that could affect the safety of the dam. In cases where any of the said geological or geotechnical information is not available, or is inadequate, the approved professional person must indicate in his or her report what additional information or investigations are required;
- (h) an analysis of the safety and stability of the dam, and the operating procedures and the maintenance of the dam, based on the inspections, assessment and evaluations effected by the approved professional person in terms of subregulation 35(4), as well as reference to the methods used,

assumptions made and standards applied for the evaluation as required in terms of subregulation 35(4)(d);

35. (6) (i) the identification of any change in respect of the information required in terms of regulation 35(4) that has come into effect since the last dam safety evaluation, and an analysis of the effects of any change;
- (j) if the dam is equipped with monitoring instruments, the monitored information to provide a representative picture of the results upon which assessments of the behaviour and safety have been based, the information being presented graphically to represent the changes over time on a scale that makes it possible to distinguish trends in the pattern of behaviour, and including a drawing to indicate the position and distribution of instruments in the structure;
- (k) an analysis of the adequacy of the existing monitoring instrument installation, the monitoring programme and the programme of the owner or person in control for periodic inspections of the dam in the light of the potential threat to human life, damage to property, and any adverse impact on resource quality;
- (l) a risk analysis on the dam and an indication of the probabilities of failure provided, **when requested by the Director-General;**
- (m) **a dam safety risk assessment must be carried out when requested by the Director-General;**
- (n) particulars of the precautions and measures to ensure public safety contemplated in subregulation 11(e), when applicable;
- (o) recommendations by the approved professional person based on his or her inspections, assessments, analyses and evaluations as required in terms of these Regulations, with regard to –
- (i) any corrective measures required to reduce to acceptable levels actual or potential shortcomings in the condition of the dam or in the quality and adequacy of the procedures for the maintenance, operation and monitoring of the dam or emergency preparedness plans as well as keeping of records in accordance with the operation and maintenance manual;
- (ii) the urgency in respect of the taking of corrective measures;
- (iii) updating or upgrading the operation and maintenance manual and emergency preparedness plan for the dam. If there is no operation and maintenance manual and emergency preparedness plan for the dam, a statement must be made with regard to the need for such documents to be compiled in terms of these Regulations;
- (iv) the need for further studies to investigate any potential shortcomings; and
- (v) any additional monitoring instruments, evaluations, inspections or observations considered necessary;

35. (6) (p) if the analyses required in subregulations 35(6)(h) and 35(6)(k) amount only to a confirmation of the findings of a previous dam safety evaluation, a summary of those findings must be included in the report, with a full reference to the previous report in which the analyses were set out;
- (q) an appropriate number of annotated colour photographs that reflect the observations or findings made during the on-site inspection;
- (r) a list of all professional staff who have taken part in the inspection evaluation or compilation of the report; and
- (s) the signature of the approved professional person responsible for the dam safety evaluation.
- (7) The contents of the dam safety evaluation report referred to in subregulation 35(6) must be limited to the information necessary to support the findings and recommendations contained in the dam safety evaluation.

#### **Dam safety evaluation for category III dam**

36. (1) The requirements and conditions set out in regulation 35 in respect of a dam safety evaluation for a Category II dam, also apply to an evaluation for a Category III dam, except that –
- (a) the dam safety evaluation and on-site inspection must be carried out by an approved professional person assisted by a professional team;
- (b) the information required by regulation 35(6)(h) must also include characteristic results obtained in the process of evaluation in terms of regulation 35(4)(d);
- (c) a risk analysis must be carried out on the dam and an indication of the probabilities provided, when requested by the Director-General;
- (d) a dam safety risk assessment must be carried out when requested by the Director-General; and
- (e) the members of the professional team must sign the relevant sections of the report for which they are responsible.

#### **Registration of dam with safety risk**

37. Unless a dam with a safety risk is already registered with the Department at the commencement of these Regulations, the owner of the dam must register that dam in terms of section 120 of the Act on an official application form obtained from the Department. The completed form must be signed by the owner and submitted to the Director-General.

#### **Decommission dam with safety risk**

38. (1) No person may –
- (a) begin to alter a dam with a safety risk with the intent to decommission the dam; or



38. (1) (b) alter the normal operation of a dam with a safety risk with the intent to decommission the dam unless he or she is in possession of a licence to decommission the dam issued by the Director-General.
- (2) Any person who intends to decommission a Category II dam or Category III dam must acquire the services of an approved professional person to design the alterations to the dam and to draw up plans and specifications for it.
- (3) In the case of decommissioning of a Category III dam the approved professional person must be assisted by a professional team.

**Licence application to decommission category I dam**

39. Any person who intends to decommission a Category I dam must apply for a licence to decommission the dam by submitting to the Director-General –
- (a) An official application form obtained from the Department and signed by the applicant;
- (b) general details of the project in accordance with regulation 41(a);
- (c) engineering drawings in accordance with regulation 43;
- (d) a description setting out in full the principles and assumptions applied in determining the proposed changes and alterations to the dam as shown on the engineering drawings; and when required by the Director-General –
- (e) an impact assessment of the decommissioning on the resource quality;
- (f) a social and environmental impact assessment; or
- (g) any combination of sub-paragraphs 39(1)(e) and 39(1)(f) as specified by the Director-General.

**Licence application to decommission category II or category III dam**

40. Any person who intends to decommission a Category II or III dam must apply for a licence to decommission by submitting to the Director-General:
- (a) An official application form obtained from the Department and signed by the applicant;
- (b) a design report in accordance with regulation 41;
- (c) project specifications in accordance with regulation 42;
- (d) engineering drawings in accordance with regulation 43; and when required by the Director-General –
- (e) an impact assessment of the decommissioning on the resource quality;
- (f) a social and environmental impact assessment; or
- (g) any combination of sub-paragraphs 40(e) and 40(f) as specified by the Director-General.

**Design report to decommission category II or category III dam**

41. A design report for the decommissioning of a Category II or III dam must include the following information:

- (a) General details of the project, including –
  - (i) The name and address of the owner of the dam and that of the person in control;
  - (ii) the locality of the dam including a description as contained in the title deed of the property concerned, magisterial district, nearest town, distance to the nearest town, the name of the river or watercourse wherein situated (if any), the location in terms of latitude and longitude (to the nearest second of accuracy) and the water management area;
  - (iii) the reasons for decommissioning the dam;
  - (iv) the type of dam to be decommissioned, with a description of proposed alterations to the dam with reference to decommissioning;
  - (v) an indication of the quantities and types of material to be removed, demolished, and disposed of (for example, volume of earthfill, rockfill, concrete, masonry and miscellaneous waste construction material) including the physical and chemical description of any waste; and
  - (vi) the measures or works required to deal with sediment that has been deposited in the reservoir;
- (b) a description setting out in full the principles and assumptions applied in determining the proposed changes and alterations to the dam as shown on the engineering drawings;
- (c) hydrological particulars of the project, including –
  - (i) the catchment area;
  - (ii) the size of the design flood used to determine the width, side slopes, shape of the final breach, if applicable, or other relevant dimensions of the decommissioned dam wall;
  - (iii) the estimated recurrence interval of the design flood; and
  - (iv) the regional maximum flood, if applicable;
- (d) hydraulic particulars of the project, including –
  - (i) relative elevations of the river bed immediately upstream and downstream of the decommissioned dam and non-overspill crest of the remaining structure, if applicable;
  - (ii) the maximum discharge capacity of the breach in the remaining structure, if applicable; and

41. (e) particulars of the remaining structure, if applicable, including –
- (i) the maximum height of the wall;
  - (ii) the height, base width and crest width at appropriate cross-sections;
  - (iii) the upstream and downstream slopes;
  - (iv) the crest lengths of the remaining structure;
  - (v) the slopes of any breach or opening of the remaining structure; and
  - (vi) the material description type, quality, and erodibility of surfaces exposed to storm rainfall, flow of water or floods.

**Project specifications for decommissioning of category II or category III dam**

42. Project specifications must be compiled for the decommissioning of the dam and related structures, specifying –
- (a) the procedures that must be followed for decommissioning of the Category II or III dam and the equipment to be used;
  - (b) the permissible tolerances for finished surfaces;
  - (c) the burial and disposal of materials removed or demolished for abandonment of the dam; and
  - (d) the particulars of quality control to be applied.

**Engineering drawings for decommissioning of category II or category III dam**

43. Engineering drawings for the decommissioning of a Category II or III dam must include the following particulars:
- (a) The location of the dam with an indication of access routes from the nearest town;
  - (b) the contour plan of the reservoir up to non-overspill crest height of the dam, if this plan is readily available;
  - (c) the proposed alterations and changes to the hydraulic components of the dam to release water that could be dammed up by the remaining structure;
  - (d) the proposed structural alterations and changes to the dam;
  - (e) the measures or works required to deal with sediment that has been deposited in the reservoir;
  - (f) the location of burial and disposal sites for materials removed or demolished to decommission the dam;
  - (g) the particulars on a plan of a suitable scale of the nature and locality of infrastructure and development upstream and downstream of the dam that could influence the design of the decommissioning of the dam; and

43. (h) the particulars on a plan of suitable scale of the locality of other dams in the catchment area upstream of the dam that must be taken into account in the design of the decommissioning.

**Conditions and requirements of licences to decommission dam with safety risk**

44. (1) The following conditions and requirements that the holder of a licence to decommission a Category I dam must comply with, must be specified in a licence to decommission that dam:
- (a) Any deviation from the expected extent of the excavations, or the expected nature or position of structures to be exposed, demolished or altered that comes to light during the decommissioning phase, must be reported to the Director-General without delay;
  - (b) any design adjustment that in the opinion of the Director-General may be necessary on the grounds of new information becoming available, must be executed and effected meticulously and without delay;
  - (c) further information in connection with the decommissioning that is required by the Director-General must be supplied to him or her without delay; and
  - (d) assistance must be given to the Director-General or any person instructed by him or her, to conduct an investigation or obtain information or carry out inspections that, in his or her opinion, are needed during decommissioning of the dam.
44. (2) In addition to the conditions and requirements contained in subregulation 44(1) the following conditions and requirements must be specified in a licence to decommission a Category II dam:
- (a) In the case of any change of typical particulars that appear on engineering drawings submitted in terms of regulation 43 or changes to design principles that are considered necessary by the approved professional person and on which information has been furnished in the documents submitted in terms of regulations 41 and 42, a report must be made in writing to the Director-General on the nature, extent and implications of the changes at least 30 days before the changes are implemented;
  - (b) the approved professional person must –
    - (i) see to it that the necessary measures are taken to ensure that the changes and alterations to the dam are performed in accordance with the engineering drawings and specifications;
    - (ii) when applicable, see to it that the requirements for impact assessments related to resource quality, social aspects and the environment have been addressed;
    - (iii) ensure that an up to date set of “completion” drawings showing all alterations is compiled;
    - (iv) ensure that up to date information on the decommissioning of the dam is kept, and compile a completion report; and

44. (2) (b) (v) issue a completion certificate for decommissioning;
- (c) copies of the completion certificate, "completion" drawings and specifications, and a completion report on the decommissioning must be submitted to the Director-General within 120 days after the date of the issuance of the completion certificate;
- (d) if the approved professional person is no longer able to carry out his or her duties, the Director-General must be notified without delay, and steps must be taken to replace him or her; and
- (e) if the Director-General deems it necessary, the approved professional person must have an approved alternate to take over his or her duties if he or she is not able to carry them out.
44. (3) In addition to the conditions and requirements contained in subregulations 44(1) and 44(2), the following conditions and requirements must be specified in a licence to decommission a Category III dam:
- (a) Reports on the quality control of the construction work and progress reports must be submitted to the Director-General at prescribed times;
- (b) in cases where the Director-General deems it reasonably necessary, excavation, drilling, demolition, burial and disposal of materials, landscaping, rehabilitation or other activities on a part of the project may not begin before information or particulars requested by the Director-General are supplied to him or her, and his or her requirements have been complied with;
- (c) record must be kept of earth, concrete, rock interfaces and buried structures as exposed by excavations, drilling work or demolition during decommissioning of the dam in order to identify deviations from assumed conditions and to compile information on true "as built" foundation conditions; and
- (d) the approved professional person must have an alternate approved to take over his or her duties if he or she is unable to carry them out.
44. (4) Upon receipt of the completion certificate the Director-General may remove the dam from the register of dams with a safety risk, or amend the register to indicate that the dam has been decommissioned.

#### **Approval of professional person and professional team**

45. (1) A professional person desiring for the purposes of a provision of these Regulations to be the approved professional person for a task required in terms of these Regulations in connection with a specific project, must apply in writing for the necessary approval by providing the Director-General with –
- (a) a description of the project and the nature of the task or tasks to be undertaken;
- (b) particulars of his or her qualifications, training and experience in dam engineering; and

45. (1) (c) an official application form obtained from the Department and signed by the professional person.
- (2) An application contemplated in subregulation 45(1) must be processed by the Director-General and forwarded to the Engineering Council of South Africa for evaluation, except when the procedure provided for in subregulation 45(9) is followed.
- (3) The Engineering Council of South Africa may establish a committee to process an application contemplated in subregulation 45(1).
- (4) A recommendation by the Engineering Council of South Africa as a result of an evaluation contemplated in subregulation 45(2) must be recorded and submitted to the Director-General in writing.
- (5) The Engineering Council of South Africa may recommend an application contemplated in subregulation 45(1) for approval subject to conditions if shortcomings in experience or exposure related to specific fields of dam engineering have been identified in an application.
- (6) The Director-General must take into consideration the recommendation by the Engineering Council of South Africa before granting a final approval of an application contemplated in subregulation 45(1).
- (7) In the case of a refusal of approval of an application contemplated in subregulation 45(1), the applicant must be given an opportunity to make representations to the Director-General within a reasonable time.
- (8) A recommendation for approval in terms of subregulation 45(5) must include –
- (a) the fields where the professional person must be assisted in the task; and
- (b) the qualifications and experience of the person or group of persons who must provide the assistance.
- (9) The Director-General may approve an application by a professional person for any task for a dam with a safety risk taking into account a previous recommendation by the Engineering Council of South Africa, provided that –
- (a) The type of dam is the same, or can be logically associated with a similar category or combination of dam types, for which the applicant has been previously approved;
- (b) the height of the dam as defined in these Regulations does not exceed that for which the applicant has been previously approved by more than –
- (i) three metres in the case of small dams;
- (ii) five metres in the case of medium dams; and
- (iii) seven metres in the case of large dams
- (c) the task is, in the opinion of the Director-General, no more complex than that for which the applicant has previously been approved.

45. (10) In the case of tasks to be carried out for a Category III dam, a professional person must apply to the Director-General for approval of members of the professional team on an official form provided for that purpose. The name, qualifications, curriculum vitae, employer, relevant professional experience and description of the component of the task entrusted to each team member must be provided.
- (11) The professional person must be informed in writing of any decision of the Director-General in terms of this regulation.
- (12) A professional person contemplated in subregulation 45(1) must –
- (a) inform the owner of the dam of the decision by the Director-General whether the application has been approved, conditionally approved or not approved; and
  - (b) apply to the Director-General for approval of a person or group of persons to assist him or her in the specified field of dam engineering if the approval is subject to conditions requiring assistance.
- (13) An application contemplated in subregulation 45(12)(b) must include the name, qualifications, curriculum vitae, employer, and relevant professional experience of the person or group of persons providing assistance.

#### **Register of approved professional persons**

46. (1) The Director-General may establish a register of approved professional persons in consultation with the Engineering Council of South Africa providing for different classes of approved professional persons in accordance with subregulation 46(2) to subregulation 46(7).
- (2) The different classes of approved professional persons must be established by specifying the maximum vertical height of the dam wall, type of dam wall, conditions in accordance with subregulation 45(5), and type of task that the approved professional person may undertake.
- (3) The requirements for admission to a class of approved professional persons on the register are the same as those for regulating the approval of a professional person as an approved professional person for a specific task as set out in regulation 45(1), **with the additional requirement** that the professional person has successfully completed at least one task for a specific dam as the approved professional person in accordance with these Regulations.
- (4) The register must be updated at least two times per annum and made available within a reasonable time to any person who has made a written request to the Director-General for a copy of the register.
- (5) An approved professional person on the register may undertake tasks as provided for on the register without having to re-apply as in accordance with regulation 45(1).
- (6) An approved professional person may only perform a task or tasks within the class or classes for which he or she has been approved and must –

46. (6) (a) follow the procedure outlined in subregulation 45(10) for tasks related to Category III dams, if applicable;
- (b) follow the procedure outlined in subregulation 45(12)(b) in the case of a conditional approval; and
- (c) submit a completed form, signed by him or her to the Director-General and the owner of the dam, confirming that he or she has been appointed to perform a specific task or tasks, within 7 days of the appointment.
- (7) If a professional person wishes to be admitted to a different class of approved professional persons, for example, to be approved to perform a task on a higher dam of the same type for which he or she was previously approved, or to perform a task on a different type of dam with a safety risk, then an application must be submitted to the Director-General as provided for in subregulation 45(1). The application must indicate the class or classes for which approval is required.

**Procedure for cancellation, withdrawal or suspension of approval of professional person**

47. (1) An approval of a professional person to undertake a specific task or tasks contemplated in regulations 45 and 46 may be cancelled and an approved professional person's name removed from one or more classes on the register by the Director-General when, in the opinion of the Director-General –
- (a) the professional person fails or has failed to comply with provisions of section 119 of the Act;
- (b) the professional person has been involved in the illegal construction, enlargement or alteration of a dam for which a licence to construct in terms of these regulations has not been issued;
- (c) the approved professional person has been identified as the responsible party for delaying completion of a task, is not able to undertake or complete a task, and there is no expectation that the task will be completed within reasonable time and there could be –
- (i) an increased risk of potential loss of life;
- (ii) an increased risk of damage to property; or
- (iii) an increased risk of an adverse effect on resource quality or damage to the environment;
- (d) the task undertaken is outside the approval granted with respect to dam wall height, dam wall type or type of task as provided for in regulations 45(9) or 46(1); or
- (e) the professional person or person is not a registered person in terms of the Engineering Profession Act, 2000 (Act No. 46 of 2000).
- (2) The Director-General may lay down conditions that must be complied with before consideration will be given to possible re-instatement of the approval of an professional person or before consideration of new applications from the professional person in terms of regulation 45.



47. (3) In the case of a proposed cancellation of an approval or removal of the professional person's name from the register in terms of subregulation 47(1), the professional person must be given an opportunity to make representations within a reasonable and specified time to the Director-General.
- (4) In the case of a proposed cancellation of an approval or removal of the professional person's name from the register in terms of subregulation 47(1) and laying down conditions in terms of subregulation 47(2), the Engineering Council of South Africa must be consulted prior to a final decision by the Director-General.
- (5) The Director-General may suspend the approval of a professional person to undertake a task or tasks in accordance with subregulation 45 and 46, before and until the procedures provided for in subregulations 47(1) to 47(4) have been completed. The Director-General may withdraw the suspension on the basis of new information that comes to light.
- (6) An approval for a specific task must be cancelled by the Director-General when –
- (a) the approved professional person informs the Director-General in writing that his or her appointment has been terminated by the owner of the dam before the task has been completed in accordance with these Regulations; and
  - (b) the approved professional person informs the Director-General in writing that he or she has been forced to withdraw as the approved professional person, before the task has been completed in accordance with these Regulations, for reasons beyond his or her control.
- (7) The name of an approved professional person must be removed from the register on written request by the approved professional person.
- (8) When an approval has been cancelled, suspended, or the name of a person removed from the register by the Director-General, the owner of the dam must –
- (a) be notified in writing by the Director-General that the professional person is unable to carry out his or her duties; and
  - (b) take steps to appoint a professional person who can be approved as the approved professional person to carry out or complete the task in terms of these Regulations.
- (9) When an approval of a professional person has been cancelled, suspended or the name of the approved professional person removed from the register by the Director-General, the professional person must be notified thereof in writing by the Director-General within reasonable time.
- (10) A professional person may be re-instated to the register, or approved to be the approved professional person for a specific task, when he or she has satisfied the Director-General that –
- (a) the reasons for removal of the name of the professional person from the register no longer exist;

47. (10) (b) the reasons for cancellation of an approval for a specific task, or tasks, no longer exist; and
- (c) the conditions laid down by the Director-General in accordance with regulation 47(2) have been complied with.
- (11) The Director-General must consult the Engineering Council of South Africa prior to making a final decision contemplated in subregulation 47(10).

**Offences and penalties**

48. A person who contravenes or fails to comply with any provision of these Regulations is guilty of an offence and liable on conviction to a fine or imprisonment for a period not exceeding five years.

**Repeal of regulations**

49. The Regulations promulgated by Government Notice No. R. 1560 of 25 July 1986 are hereby repealed.

## Annexure

## Tables for the classification of dams with a safety risk

Table 1: Size classification

Size class	Maximum wall height in metres (m)
Small .....	More than 5 m but less than 12 m.
Medium .....	Equal to or more than 12 m but less than 30 m.
Large .....	Equal to or more than 30 m.

Table 2: Hazard potential classification

Hazard potential rating	Potential loss of life	Potential economic loss	Potential impact on resource quality
Low .....	None .....	Minimal	Low
Significant .....	Not more than ten ...	Significant	Significant
High .....	More than ten .....	Great	Severe

Table 3: Category classification of dams with a safety risk

Size class	Hazard potential rating		
	Low	Significant	High
Small .....	Category I .....	Category II .....	Category II .....
Medium .....	Category II .....	Category II .....	Category III .....
Large .....	Category III .....	Category III .....	Category III .....









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