

GruvRIDAS

Mining Industry Guidelines for Dam Safety

L-Å Lindahl

2007-10-22

GruvRIDAS – why?

- *Swedish mining companies have applied guidelines developed by the hydropower industry "in relevant parts" since ten years.*
- *In many cases our dams are built using other designs and materials than conventional water retention dams, e.g. using by products from the production.*
- *Our dams are in many cases built in steps or continuously.*
- *Our dams are sometimes constructed to keep their function for very long periods of time, i.e. when they are an integrated functional part of the plans for mine closure.*
- *Other risk categories may be at hand.*

RIDAS

- The Swedish hydropower industry, through Swedenergy, have developed their own guidelines for dam safety, RIDAS
- RIDAS first edition was approved in February 1997, and was revised in 2002
- RIDAS consist of a main document with application guidelines linked to each chapter. It is foreseen that the guidelines will be revised whenever research, development and experience result in significant new knowledge
- RIDAS can be applied to new and existing dams
- RIDAS shall be used for dams in consequence class 1A, 1B and 2

GruvRIDAS – when?

- *June 2005 – Agreement with Swedenergy signed*
- *November 2005 – Dam safety policy approved*
- *May 2006 – Internal review of first draft*
- *November 2006 – External review*
- *March 2007 – Approved by SveMin board*
- *Q2 2007 - Main document published*
- *Q3 2007 – Application guidelines published on the web*

GruvRIDAS

Gruvindustrins riktlinjer för dammsäkerhet

2007



SveMin

Föreningen för gruvor, mineral- och metallproducenter i Sverige
Box 1721 • 111 87 Stockholm • <http://www.sve.min.se>

Objectives

- Overall objectives for the guidelines are:
 - Define requirements and establish guidelines for adequate and uniform dam safety
 - Constitute a basis for uniform evaluation of dam safety, and help identify measures needed to increase dam safety
 - Support the authorities in their supervision of dam safety

Foundation

- The basic building blocks when establishing the guidelines have been:
 - The mining industry dam safety policy
 - A classification system according to consequences of potential failure
 - Established and documented working procedures and design criteria
 - Established competence requirements
 - Systematic compilation of experiences
 - Continuous improvements
 - Transparency
 - Auditing

Consequence classification

- The dam safety work is governed by the potential consequences. Dams should be classified according to the consequences if a dam failure should occur
- The consequences of a dam failure is evaluated with respect to the probability for:

Loss of human life or serious injuries

Damages to the environment, public installations and other values of economic importance

(continued)

- The classification system consists of four classes; 1A, 1B, 2 and 3
- 1A is the class for the most serious consequences

Consequence classes

POSSIBLE CONSEQUENCE OF A DAM FAILURE		
Consequence class	Loss of human lives	Infrastructure, environment and property
1A	High probability of loss of many human lives	<p>High probability for very serious damage of</p> <ul style="list-style-type: none"> • important societal facilities, • important environmental values <p>or</p> <p>very large economic damage</p>
1B	Probability for loss of human lives or serious injuries is not negligible	<p>Considerable probability of serious damage of</p> <ul style="list-style-type: none"> • important societal facilities, • important environmental values <p>or</p> <p>high probability of large economic damage.</p>
2		<p>Non-negligable probability of considerable damage of</p> <ul style="list-style-type: none"> • societal facilities, • environmental values <p>or</p> <p>economic damage</p>
3		

Design and construction

- Describes the design and construction of dams with respect to:
 - Loads
 - Embankment dams
 - Discharge facilities with spillway capacity according to the national guidelines for Design Flood Determination

Operation, Monitoring and Maintenance

- Organisation and competence requirements
 - Organisation and responsibility should be established and documented
 - Competence requirements for personnel should be defined and documented
- Every dam should have an individually developed manual which describes the safe operation of the dam, the “OMM-manual”

OMM manuals

- The OMM manual contains among other things:
 - Dam safety organisation
 - Technical data and specifications
 - Instructions for normal and serious flows and situations
 - Instructions or programs for monitoring and reports from monitoring
 - Documentation from the systematic maintenance

Monitoring

- Dam owner responsibility, divided into:
 - Operational monitoring (surveillance)
 - Dam measuring
 - Inspections
 - Surveys
 - Comprehensive dam safety evaluations

Surveillance

- Operational monitoring (surveillance)
 - Operational monitoring of parts of the facility, vital to dam safety is carried out at intervals and with a scope related to the needs of the specific dam. Usually daily rounds.

Dam measurements

- The objective of the dam measurements is to give an early indication of changes in the behavior and condition of the dam
- For each dam a specific measuring program should be established.

Inspections

- The objective of inspections is to evaluate possible changes and verify dam safety at regular intervals.
- For dams belonging to consequence class 1A and 1B, inspections are carried out four times a year. For other dams, twice a year.
- The inspections should be documented.

Surveys

- For dams belonging to consequence class 1A and 1B a deeper survey is performed every second year, for class 2 dams every 3 years.
- In the survey all safety-related vital technical components and important documentation is checked.
- The survey should be documented and results in a dam safety evaluation.

Comprehensive dam safety evaluation

- The objective of the evaluation is to establish dam safety status in view of current safety requirements
- Dams belonging to consequence class 1A should be subject to a comprehensive evaluation every 10 years, class 1B every 24 years and class 2 every 15 years.
- The evaluation is a comprehensive and systematic evaluation of the safety of a dam facility, based on a total analysis of all safety components and the entire system
- The evaluation should be documented in a report

Register of dams and incidents

Svenska Gruvdammregistret

Du är här: [Hem](#) » [Årtik 26](#) » Sandmagasin

Årtik 26

- Klärningsmagasin
- **Sandmagasin**
 - Damm 1

▪ Lägg till damm

▪ Tidigare versioner

▪ Visa felrapporter

▪ Sök felrapporter

▪ Ny felrapport

▪ Sökning

▪ Sajtcharta

▪ Logga ut

Namn: Sandmagasin

Byggtekn. uppg. Övervakning & larmHydrotekn. uppg. DamarFDU, besiktning & inspektioner

Magasinskoord-X:	Area: (km ²)
<input type="text"/>	<input type="text"/>
Magasinskoord-Y:	Årsdeponering: (milj m ³)
<input type="text"/>	<input type="text"/>
Datum:	Total deponerad volym (milj m ³):
<input type="text"/>	<input type="text"/>
Magasintyp:	Magasinstatus:
Sandmagasin	Aktivt
Utbyggd kapacitet: (milj m ³)	
<input type="text"/>	
Beskrivning av efterbehandling:	
<input type="text"/>	

Visad version: 3 | Senaste publika version: 3

Kungsträdgårdsgatan 10 | Box 1721 | 111 87 Stockholm
Tfn: 08- 762 67 35 | Fax: 08-611 62 64
www.svemin.se | info@svemin.se

SveMin

Klar

Start Microsoft Outloo... Gruvdammregis... Samråd LST&Ko... Kartor zdenka

Register of dams and incidents

Objective – Collate technical data and experience, “learning by sharing”, basis for statistical analysis

Two parts:

- **Register** (technical data)
- **Incident reporting**

Emergency preparedness

- A dam owner must have good preparedness to be able to handle situations that could lead to dam failure.
- A documented Emergency Preparedness Plan must exist for the events of critical situations, increased risk of damage to the dam and dam failure

Dam Safety Auditing

- That the dam safety work is being carried out in accordance with GruvRIDAS should be verified through audits.
- Auditing is carried out by two independent auditors with SveMin as their principal.

Welcome to
"Securing the Future" and the 8th ICARD
Skellefteå, Sweden, 22 - 26 June 2009

www.securing.skelleftea.se