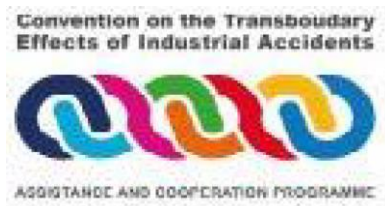




Technical meeting

to prepare for the on-site training in Tajikistan and to enhance capacity for governance and policy making on tailings safety in Central Asia

23 April 2021



UNECE Safety Guidelines and Good Practices for Tailings Management Facilities (TMFs). Introduction to the checklist for on-site training, evaluation of results and measure catalogue

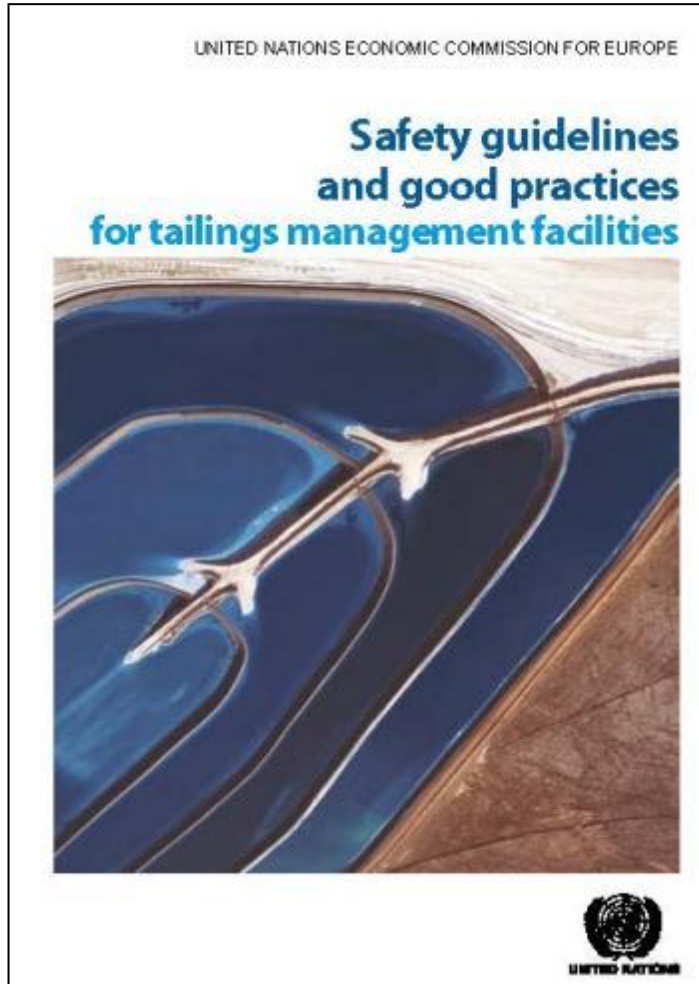


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Schweizerische Eidgenossenschaft
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The UNECE Safety Guidelines as a Basis for the Checklist

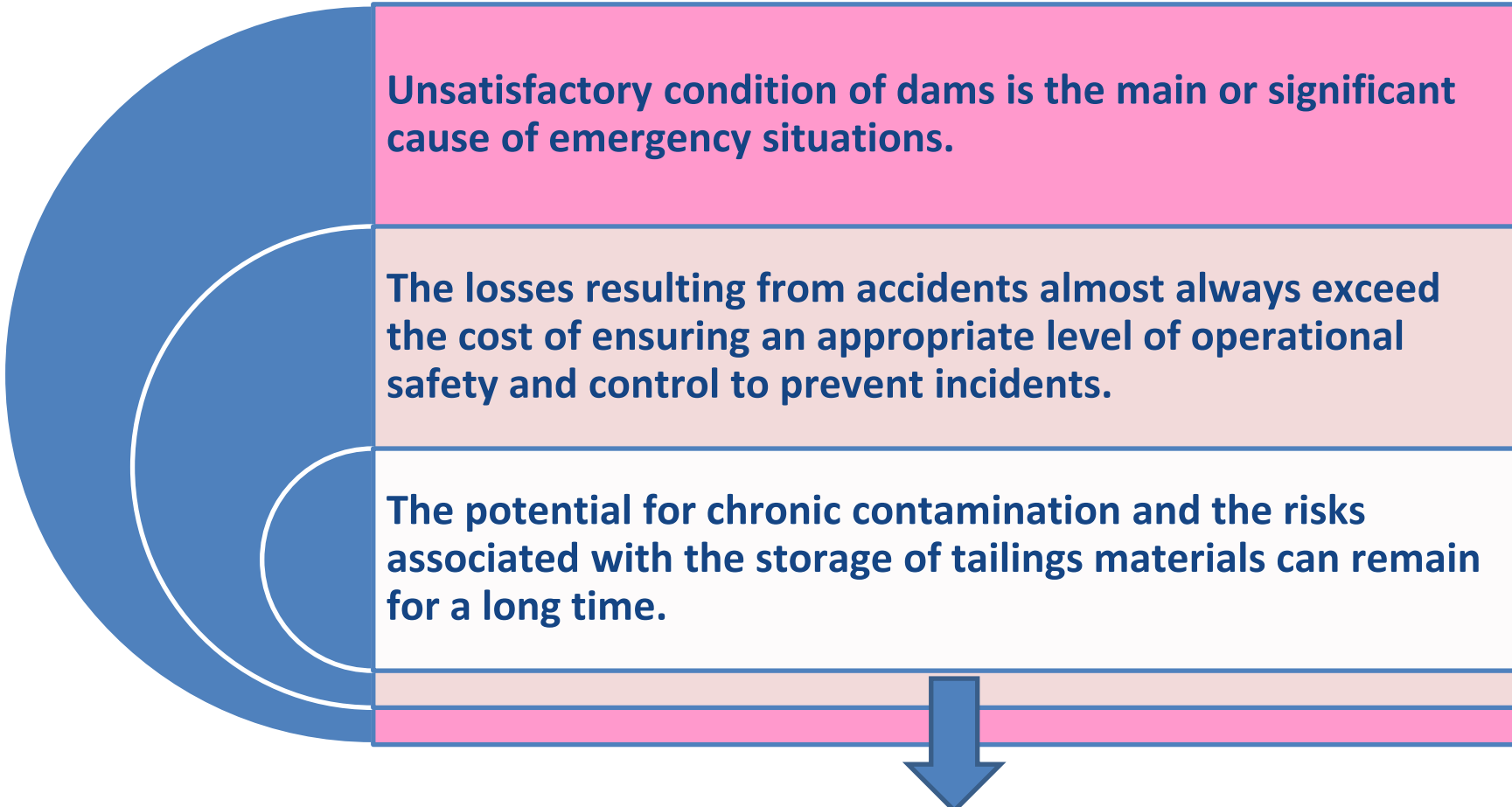


- «Safety guidelines...» were developed by the Joint Expert Group on Water and Industrial Accidents with the support of the UNECE secretariat.
- «Safety guidelines...» were approved at the fifth meeting of the Conference of the Parties to the Industrial Accidents Convention (Geneva, 2008) and the fifth session of the Meeting of the Parties to the Water Convention (Geneva, 2009).
- The document was updated in 2014.

«Safety guidelines ...». Content

Part A	<ul style="list-style-type: none">• Introduction,• Principles of ensuring the operational safety of tailing dumps,• Recommendations to countries, competent authorities and tailings storage operators.
Part B	TECHNICAL AND ORGANIZATIONAL ASPECTS, INCLUDING <ul style="list-style-type: none">• Design and construction,• operation and management,• site inspections,• identification, evaluation and management of unattended objects,• emergency planning.
Part C	Links to international documents.

«Safety guidelines ...». Relevance



Unsatisfactory condition of dams is the main or significant cause of emergency situations.

The losses resulting from accidents almost always exceed the cost of ensuring an appropriate level of operational safety and control to prevent incidents.

The potential for chronic contamination and the risks associated with the storage of tailings materials can remain for a long time.

The importance of following the rules of proper operation, closing tailings and waste storage sites in order to avoid unacceptable risks or negative impacts in the future.

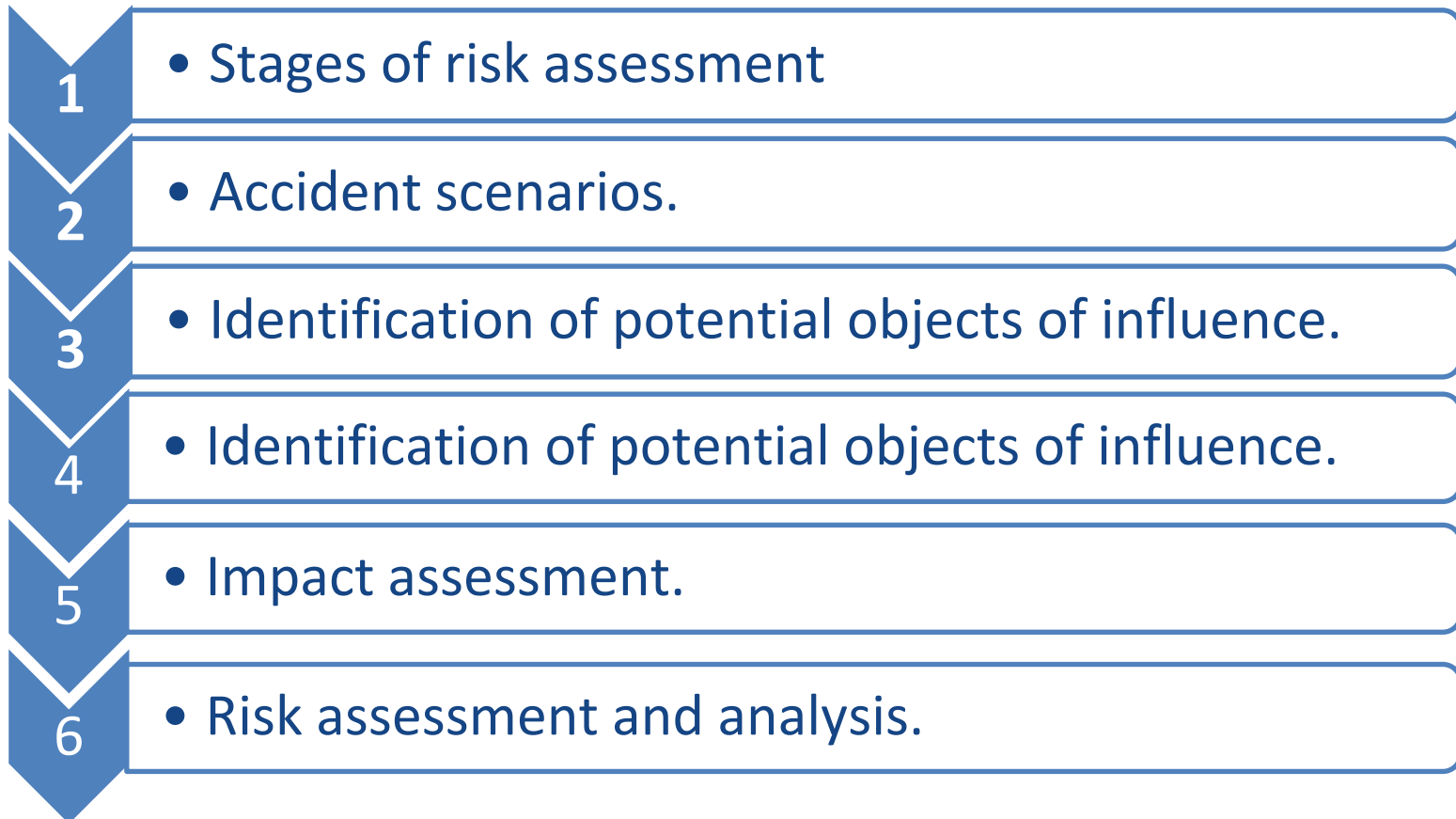
«Safety guidelines ...».

Ensuring the safety of tailing dumps

1. **The operators have the primary responsibility** for ensuring the safety of the tailing dumps.
2. An individualized or **site-by-site approach** should be applied to the **planning, construction, operation and closure of tailings facilities**.
3. All work related to tailing dumps should be carried out only by **competent and certified personnel**.
4. A systematic approach to the management of the safety of tailing dumps during their life cycle should be followed according to the scheme "**planning - construction - operation - closure - reclamation**".
5. During the planning and design phase, an understanding of the processes that occur during **the life cycle of tailing dumps** should be sought.

«Safety guidelines ...».

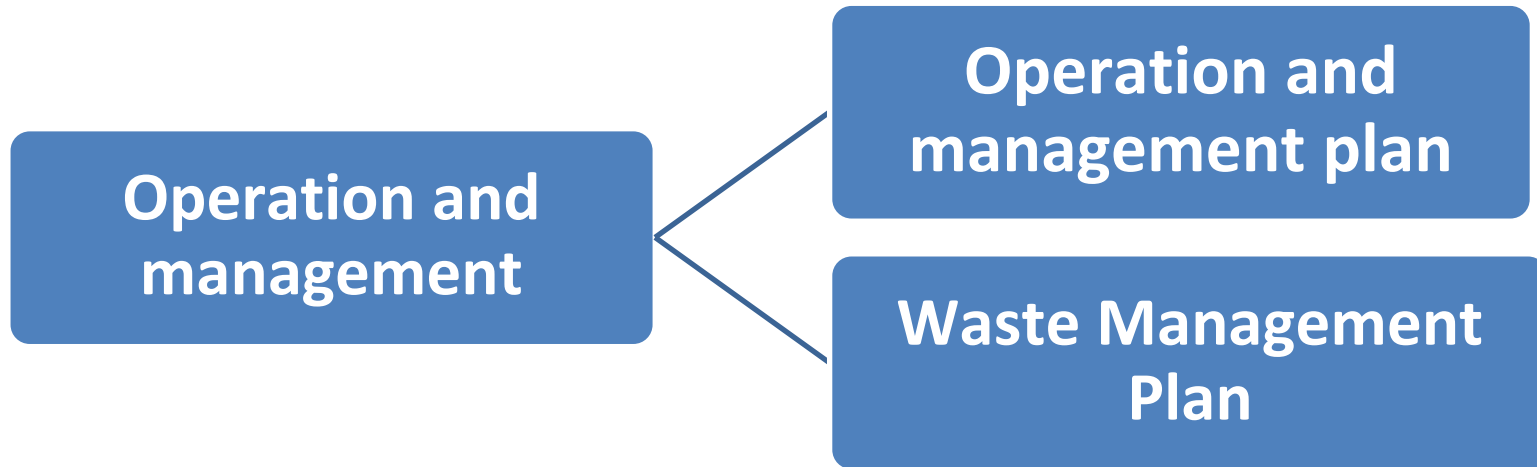
Stages of risk assessment



Special attention is paid to the sump pond and the dam.

«Safety guidelines ...».

Operation and management



The operation and management plan (Operation Manual) should contain a description of:

- **tail material transport systems,**
- **all monitoring procedures / mechanisms for the inspection;**
- **procedures for reporting nonconformities and emergencies;**
- **measures to eliminate deficiencies** that should be applied in the event of non-compliance;
- **internal PLAS;**
- **parameters for evaluating the effectiveness of the operating manual.**

«Safety guidelines ...». Inspections

Stage	What is being checked
Design and construction	<ul style="list-style-type: none">● Waste storage facility site;● Safety margin based on the design solution;● The progress of the dam construction.
Эксплуатация	<ul style="list-style-type: none">● Physical stability of the object;● No pollution of soil, air, surface and underground water;● Regularity of observations within the framework of monitoring;● Compliance with the procedure for informing about emergency situations and taking appropriate measures to prevent and eliminate them.
Closing and post-closing period	<ul style="list-style-type: none">● Physical (mechanical) stability of the object;● Environmental rehabilitation process;● Availability of proper documentation.

«Safety guidelines ...».

PLAS. Abandoned objects

The PLAS should include an assessment of:

- flood hazards in the lower and upper reaches.
- the number and types of equipment required for the disposal of hazardous substances,
- construction materials and equipment necessary for carrying out repair work.

At abandoned sites, the competent authorities should conduct regular inspections and assess the risks.

The dam, the storage pond, the water flow management systems, the catchment area, as well as the vulnerability factors for the surrounding areas are subject to verification.



Need for development

The Checklist

1

- The need for a unified approach to tailing dumps at different stages of their life cycle

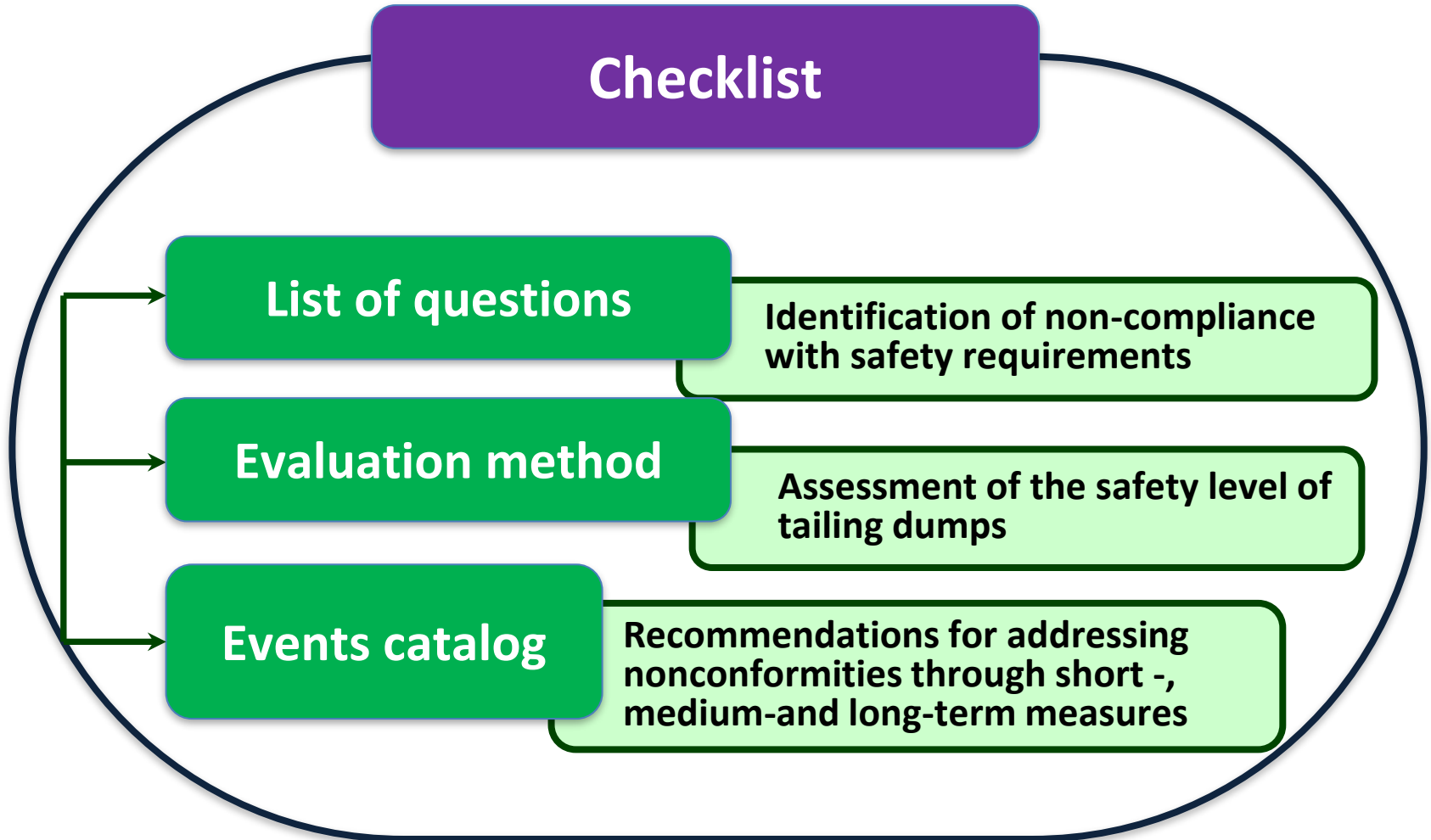
2

- The need to synchronize the verification, assessment of the safety level and prescribing measures to improve the safety of tailing dumps

3

- The need for efficient use of limited resources to verify and improve the safety of tailings storage facilities

Checklist Structure



Checklist groups, their purpose

Group of questions	Purpose
Group A "Basic verification"	Preliminary and operational assessment of the safety level of the tailings storage facility, aimed at determining the priority of subsequent detailed inspection
Group B "Detailed inspection»	Comprehensive and detailed assessment of the safety level of the tailings storage facility to determine the need for action
Group C "Checking inactive objects"	Assessment of the safety level of inactive tailing dumps to determine the need for action

Structure of the Checklist (updated based on the results of the project in Romania in 2019) for detailed verification (Group B)

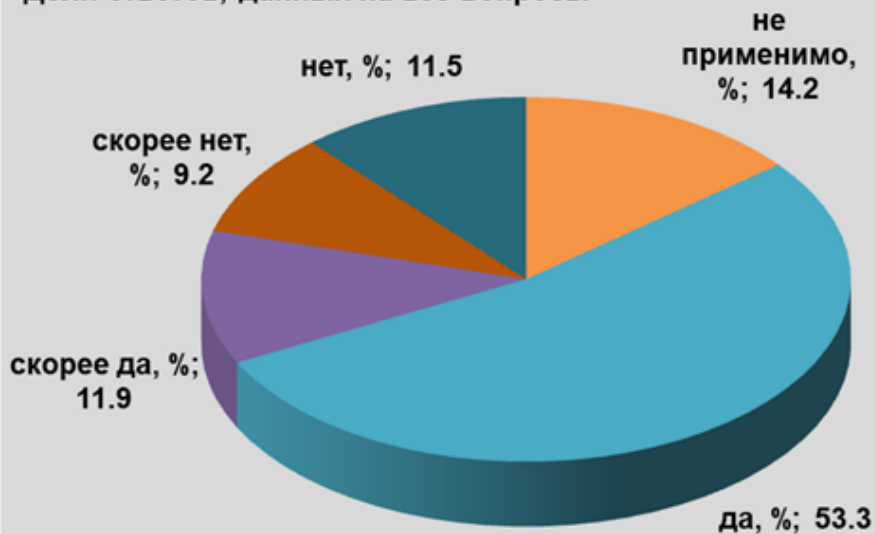
STAGE/CATEGORY OF THE TAILINGS STORAGE LIFE CYCLE	SUBGROUP 1	SUBGROUP 2
DESIGN AND CONSTRUCTION PHASE		
Hazard identification and risk assessment		26
Environmental impact assessment and land-use planning	3	21
Emergency/emergency response planning		6
Project documentation and issuance of permits	3	30
Project documentation and issuance of permits		6
OPERATION AND MANAGEMENT STAGE		
Organizational and corporate governance	9	5
Water flow management	8	13
Water flow management	5	6
Staff training and training		18
Organizational and corporate governance		17
Emergency/emergency response planning	3	26
Monitoring of infrastructure elements and processes/changes	5	12
Monitoring of environmental elements	2	13
CLOSING AND SUBSEQUENT MAINTENANCE PHASE		
Closure and reclamation plan		12
Organizational and corporate governance		8
Monitoring of infrastructure elements and changes		2
Monitoring of environmental elements		2
Total	38	223

Appearance of the list of questions (simplified)

No	Question	Answer					Question Weight	Evaluating the response	Category	Recommended activities
		N/A	yes	rather yes	rather no	no				
DESIGN AND CONSTRUCTION stage: issuing licenses										
Hazard identification and risk assessment										
1	Has a risk assessment been prepared based on the tailing dump operation manual?									

Assessment of the safety level of the tailings storage facility. Overall rating

Доли ответов, данных на все вопросы



Графическая интерпретация оценки уровня безопасности хвостохранилища по всем вопросам



The indicator “**Compliance with safety requirements**” (“**CSR**”) is defined as an index that quantifies the degree of compliance of the parameters and characteristics of the tailings storage facility with the requirements of environmental and industrial safety.

The “**Confidence**” indicator is defined as an index that quantifies the sufficiency and consistency of the data used in the calculation of the “**CSR**” indicator.

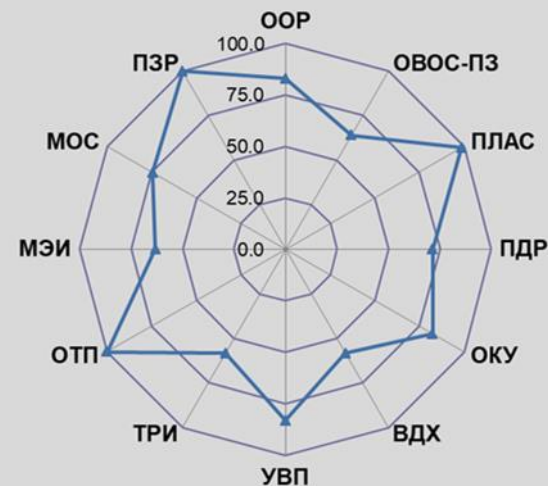
Classification of the tailings management facility based on the results of the assessment

Tailings storage safety level	Criteria
Acceptable	100% of minimum security requirements are met (CSR = 100%)
Conditionally acceptable	Less than 100% of the minimum security requirements (CSR < 100%) are met, with all the answers being "Yes" or "Rather yes".»
Unacceptable	Less than 100% of the minimum security requirements are met (CSR < 100%), there are answers "No" and "Probably not»

Assessment of the safety level of the tailings storage facility. Categorical assessment

CATEGORY	Short
Hazard identification and risk assessment	HIRA
Environmental impact assessment and land-use planning	EIA-LUP
Emergency/emergency response planning	PLAS
Project documentation and issuance of permits	PDIP
Organizational and corporate governance	OCG
Construction of dams and control of the tailings management facility	CD-CTMF
Water flow management	WFM
Transport and infrastructure	TI
Staff education and training	SET
Monitoring of infrastructure elements and changes	MIEC
Monitoring of environmental elements	MEL
Closure and reclamation plan	CRP

Лепестковая диаграмма категориальной оценки по всем вопросам



Event catalog

No	Problem to be solved	Prescribed measures	Priority
ПРОЕКТИРОВАНИЕ И СТРОИТЕЛЬСТВО			
1	Incomplete project documentation	1A. Update the project documentation with the help of a licensed company	Short-term
		1B. Update the project documentation, involving experienced personnel with the appropriate license	Short-term
.....			

BEST AVAILABLE TECHNOLOGIES (BAT) REFERENCE DOCUMENT FOR EXTRACTIVE INDUSTRY WASTE MANAGEMENT (BREF 2018)

No	Problem to be solved	Prescribed measures
1	Corporate governance	Apply BAT 1(1): Corporate Governance; Organizational and Corporate Governance System; BREF, section 5.2.1. a (p. 490)
		Apply Part 1 (2): Corporate Governance; Environmental Management System (EMS); BREF, Section 5.2.1. b (p. 490)
.....		

Main recommended activities

- Strengthening of the dam and other critical elements
- Improvement of methods for neutralizing toxic substances, drainage, monitoring, plastic PLAS procedures.
- Updating project documentation.
- Conducting expert assessments, including risk assessments within the framework of the EIA.
- Professional development of personnel, improvement of reporting.
- Development of closure and reclamation plans, use of man-made resources.

Documents on the Methodology for Tailing dumps and the Checklist

- Explanatory note to the methodology of the Checklist for Tailing Dumps and its application (rus.)
- Checklist template in MS Excel format (rus.)
- Report on the project on the safety of tailing dumps in Romania (eng.)

https://www.umweltbundesamt.de/sites/default/files/medien/5750/publikationen/2020_11_30_texte_185-2020_danube_river_basin_0.pdf

Thanks for your attention!