



Training

under the project to improve the safety of mining facilities, including tailings, in Kazakhstan and Central Asia

Kokshetau (Kazakhstan) June 11-13, 2019




UNECE Convention on the
Transboundary Effects of
Industrial Accidents

**Assistance
Programme**

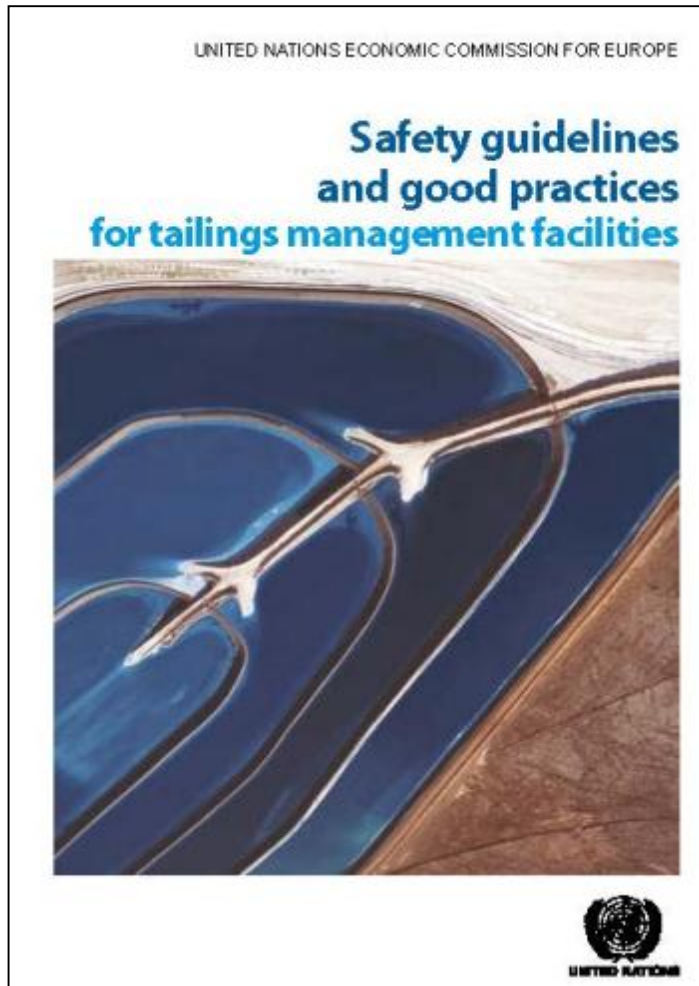


UNECE Guidelines for the Safety of Tailings. Introduction to tailings methodology and checklist

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UNECE guidelines on the safety of tailings as a basis for the Checklist



- **"Guidelines..." were developed by the joint expert group on water and industrial accidents with the support of the UNECE Secretariat.**
- **The "guidelines..." were endorsed by 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.**

«Guidelines ...». Content

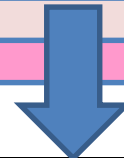
Part A	<ul style="list-style-type: none">• Introduction,• Principles of operational safety of tailing dumps,• Recommendations to countries, competent authorities and operators of tailing dumps.
Part B	<p>Technical and organizational aspects, including</p> <ul style="list-style-type: none">• Design and construction,• operation and management,• inspections on the objects,• identification, evaluation and management of orphan objects,• preparation of contingency plans.
Part C	References to international instruments.

«Guidelines ...». Urgency

Unsatisfactory condition of dams is the main or significant cause of accidents.

Accident losses are almost always higher than the cost of ensuring an adequate level of operational safety and control to prevent incidents.

The potential risk of chronic contamination and the risks associated with the storage of tail materials may persist for a long time.



The importance of compliance with the rules of proper operation, closure of tailing dumps in order to eliminate unacceptable risks and negative impact in the future.

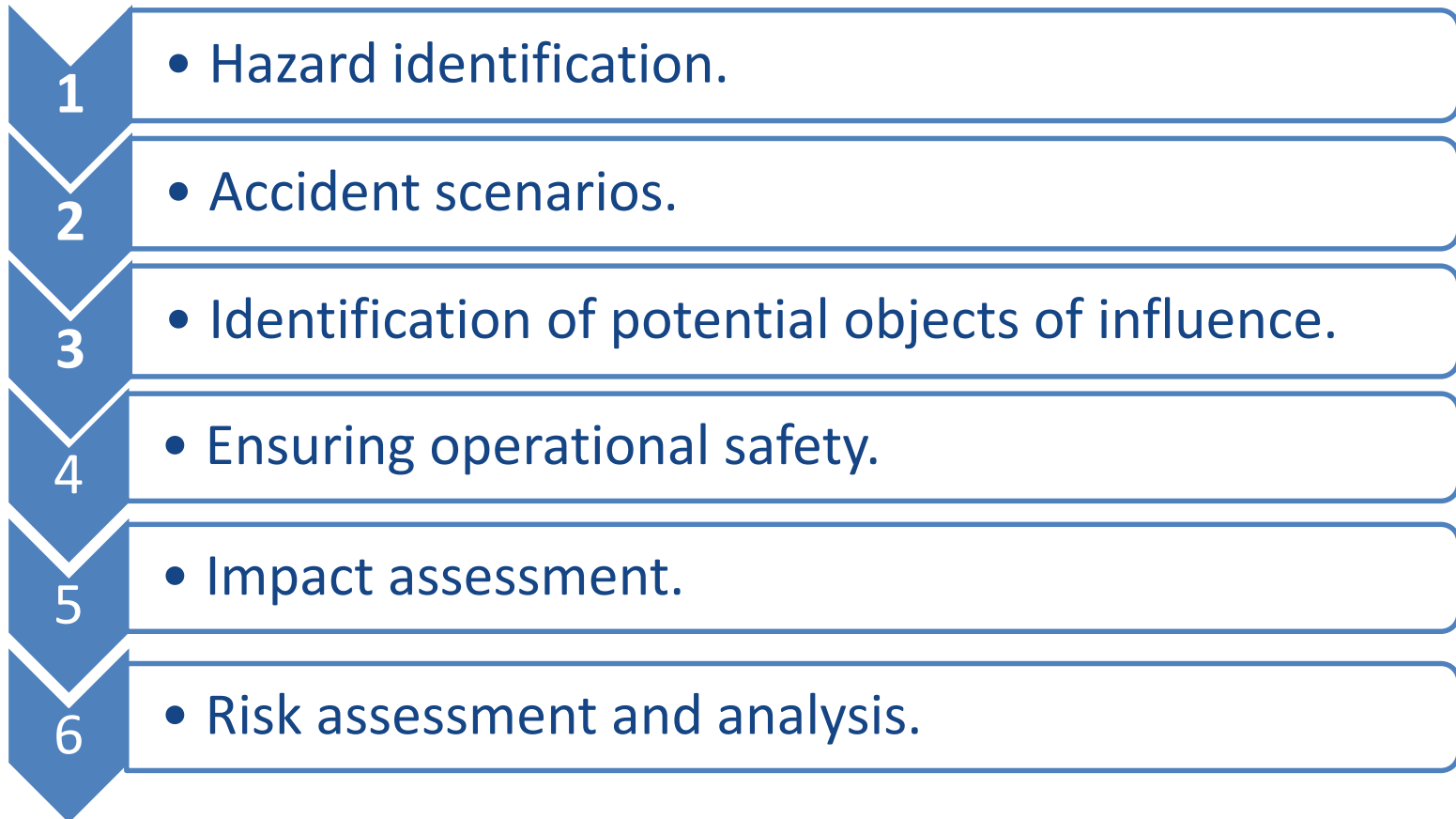
«Guidelines ...».

Ensuring the safety of tailing dumps

1. **Operators have the primary responsibility** for ensuring the safety of tailing dumps.
2. **An individualized or site-by-site approach** should be used in the planning, construction, operation and closure of tailing dumps.
3. All work related to tailing dumps should be carried out only by **competent and certified personnel**.
4. A systematic approach to the safety management of tailing dumps during their life cycle “**planning - construction - operation - closure – remediation**” should be followed.
5. During the planning and design phase, an understanding of the processes taking place during the life cycle of the tailing dumps should be sought.

«Guidelines ...».

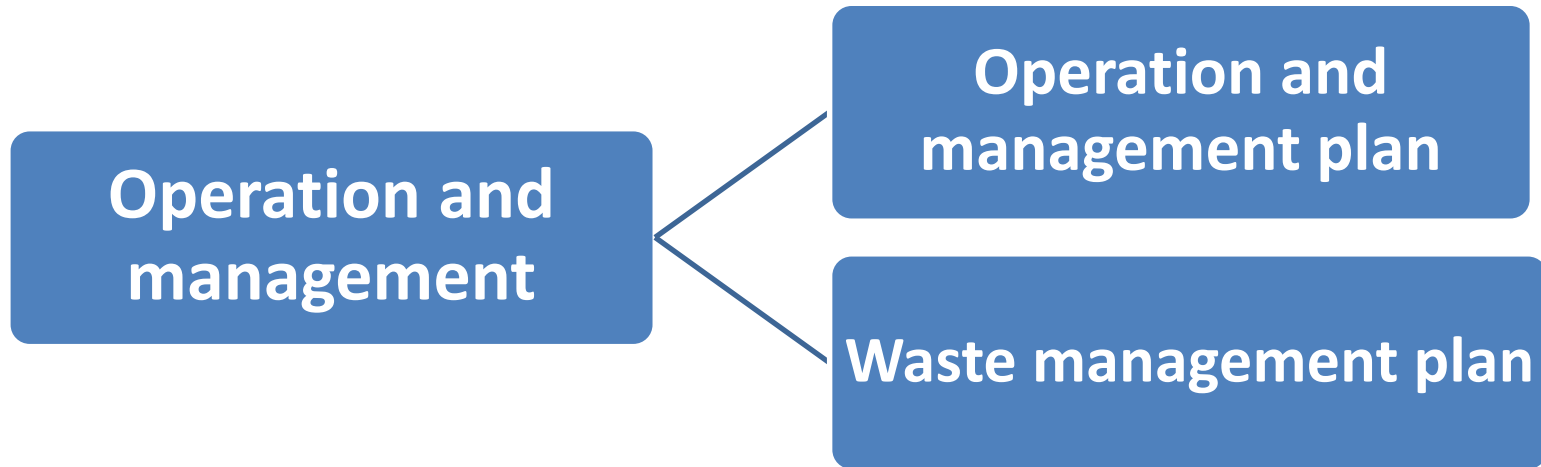
The stages of risk assessment



Special attention – pond-sump and dam.

«Guidelines ...».

Operation and management



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

- tail materials **transportation systems**,
- all **monitoring procedures / mechanisms** for inspection;
- **procedures for reporting** nonconformity and emergency situations;
- **corrective actions to be taken** in case of non-conformities;
- **internal PMLLPA**;
- Parameters for assessing the effectiveness of use.

«Guidelines ...». Inspections

Stage	What is checked
Design and construction	<ul style="list-style-type: none">• Waste storage facility;• Safety factor based on the design decision;• Construction of the dam.
Exploitation	<ul style="list-style-type: none">• Physical stability of the object;• No pollution of soil, air, surface and groundwater;• Regularity of monitoring observations;• Compliance with the procedure for informing about emergency situations and taking appropriate measures for their prevention and elimination.
Closing and Post Closing Period	<ul style="list-style-type: none">• Physical (mechanical) stability of the object;• Environmental Rehabilitation Process;• Proper documentation.

«Guidelines ...».

PMLLPA. Abandoned objects

PMLLPA should include an assessment

- **flood hazards in the downstream and upstream.**
- **the number and types of equipment necessary to eliminate the discharge of hazardous substances,**
- **building materials and equipment required for the repair work.**

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

The dam, the storage pond, water management systems, the catchment area are subject to inspection.



The need to develop a checklist

1

- The need for a unified approach to tailings at different stages of the life cycle

2

- The need to synchronize verification, assess the level of safety, and prescribe measures to improve the safety of tailings

3

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

Methodology to improve the safety of tailings

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graph TD; A[Methodology to improve the safety of tailings] --> B[Tailings Hazard Index]; A --> C[Checklist]; B --- D[Designed for rapid preliminary risk assessment (ranking) of a large number of tailings at the national / regional level]; C --- E[Designed for detailed assessment of individual tailings]
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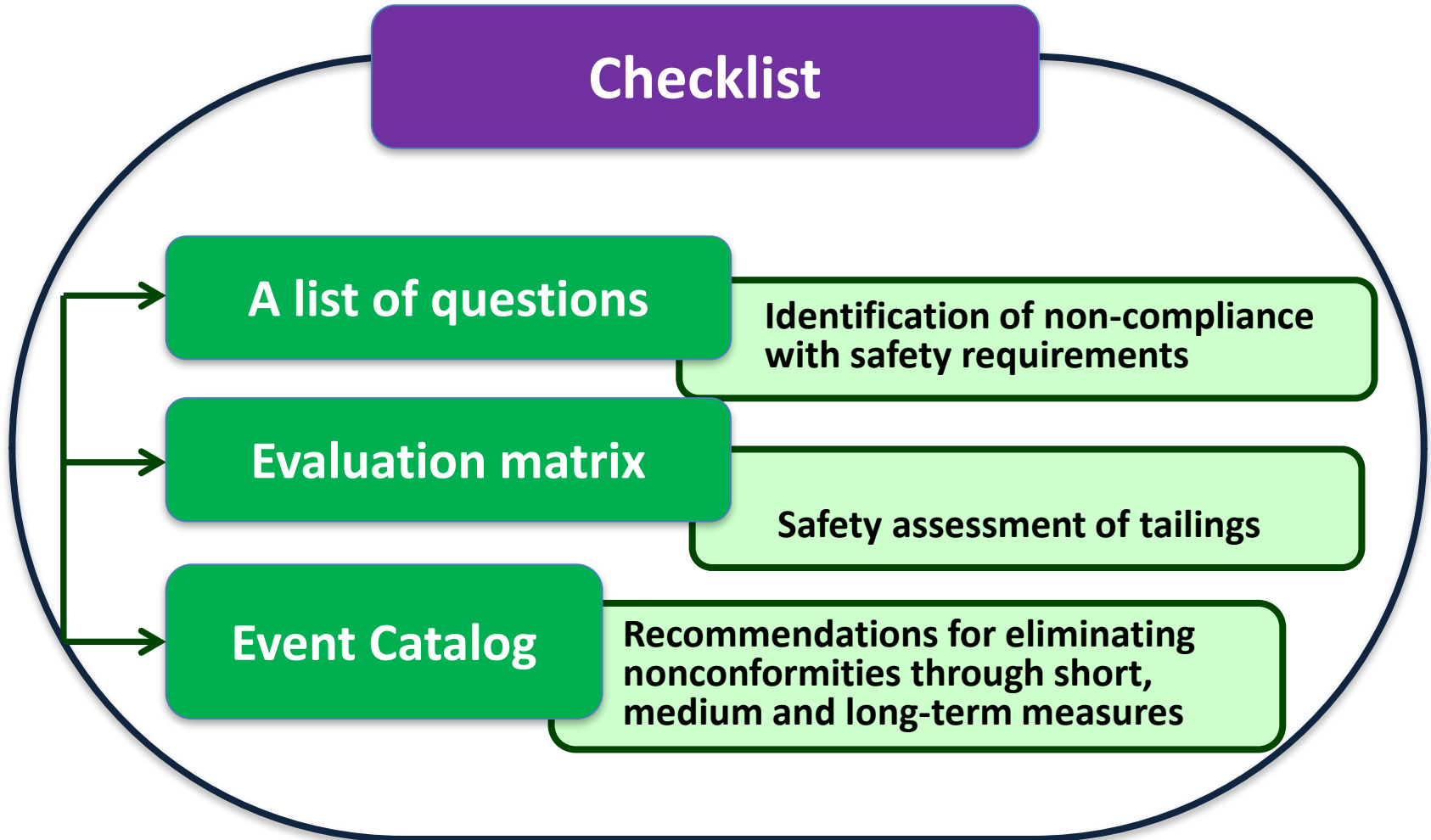
Tailings Hazard Index

Designed for rapid preliminary risk assessment (ranking) of a large number of tailings at the national / regional level

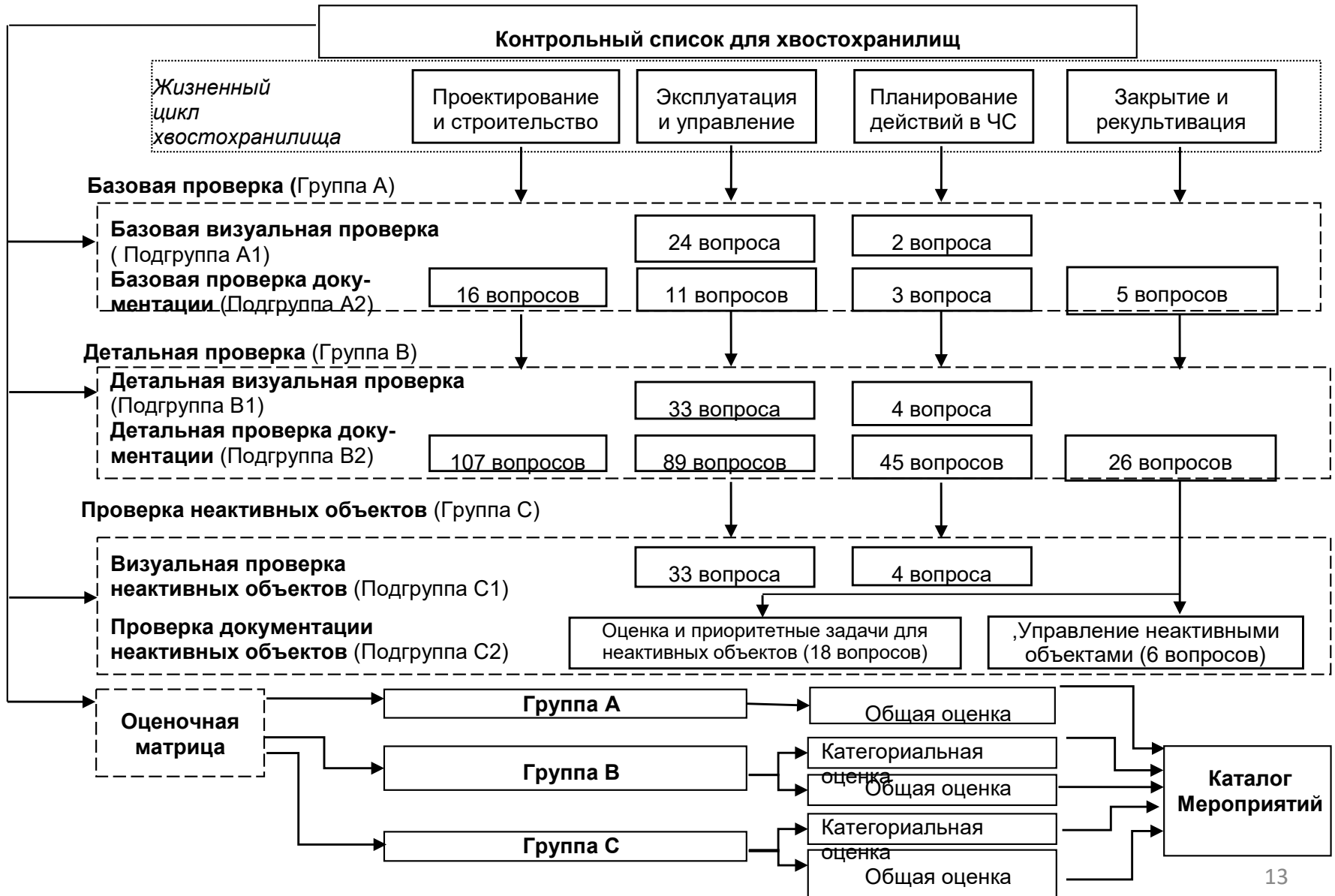
Checklist

Designed for detailed assessment of individual tailings

Checklist Structure



Detailed structure of the Checklist



Group A

Group of questions	Purpose	Data source	Users
Group A “Basic check”	Preliminary and rapid assessment of the safety level of the tailings storage facility, aimed at determining the priority of the subsequent detailed verification	Available documentation of the tailings operator, interviewing of tailing personnel	Competent public authorities

Group B

Group of questions	Purpose	Data source	Users
Group B "Detailed check"	Comprehensive and detailed assessment of the tailings safety level to determine the need for action	Existing documentation of the tailings operator; additional studies and tests that clarify all the parameters of the tailings, performed, including with the involvement of external experts; visual inspection; tailing personnel interviewing	State inspectors and operators of tailings

Group C

Group of questions	Purpose	Data source	Users
Group C “Check for inactive objects”	Assessing the safety level of inactive tailings to determine the need for action	Existing documentation of the tailings operator, additional research and tests that clarify all the parameters of the tailing dump, carried out with the assistance of external experts, visual inspection, interviewing of tailing personnel	State inspectors and operators of tailings

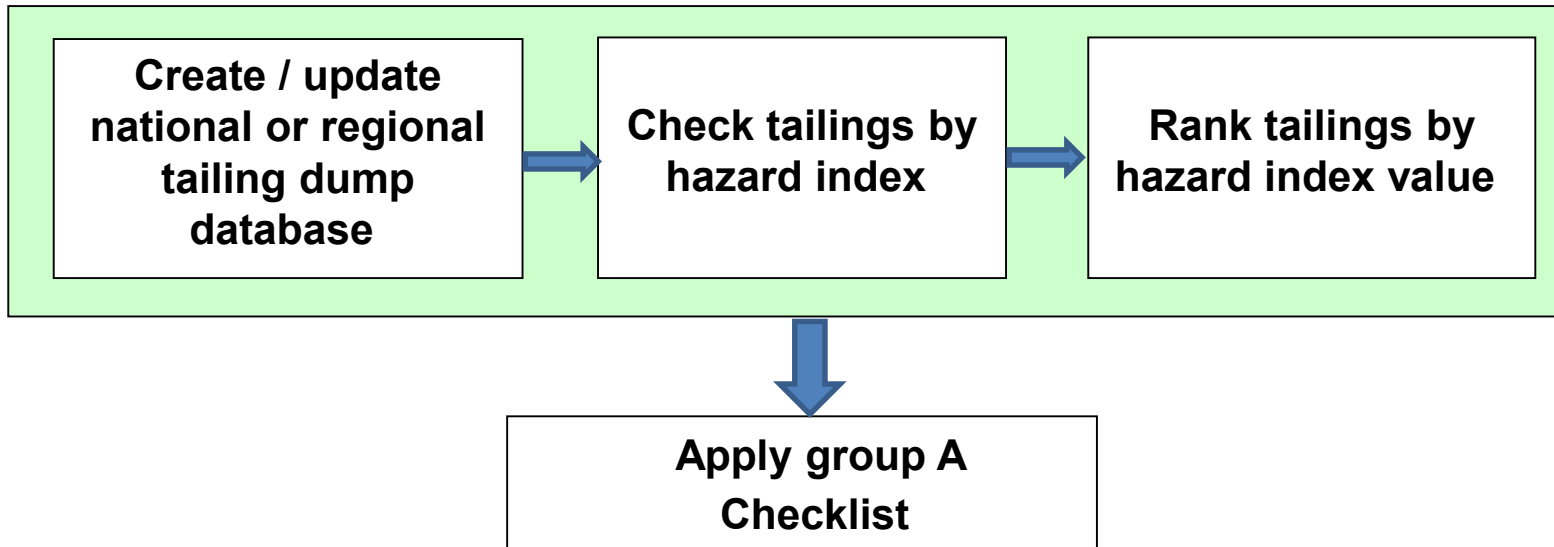
Appearance of the questionnaire Checklist

No	Question	Recommendation (factors and parameters that need to be taken into account when answering a question)	Answer					Data source (details of documents or photos as evidence)
			not applicable*	yes	rather yes	probably not	not	
Recheck data								
1	Does the project documentation correspond to the actual location of the tailings?	Correspondence of plans and maps to the displayed elements of the tailings on the ground						

Tailings Assessment Program

No	Evaluation stage	Date
1	Preparation of a request for obtaining general information about the object of assessment (enterprise and tailing dump)	1 day
2	Development and dispatch of the “Plan of the visit to the site”	up to 5 days
3	Object visit	1-2 days
4	Assessment of the tailings using the Checklist (MS Excel file), including the study of documents and information obtained in the previous stages	10-20 days
5	Sending an additional request for documents on the tailing dump (if necessary)	1-2 days
6	Report generation	5 days

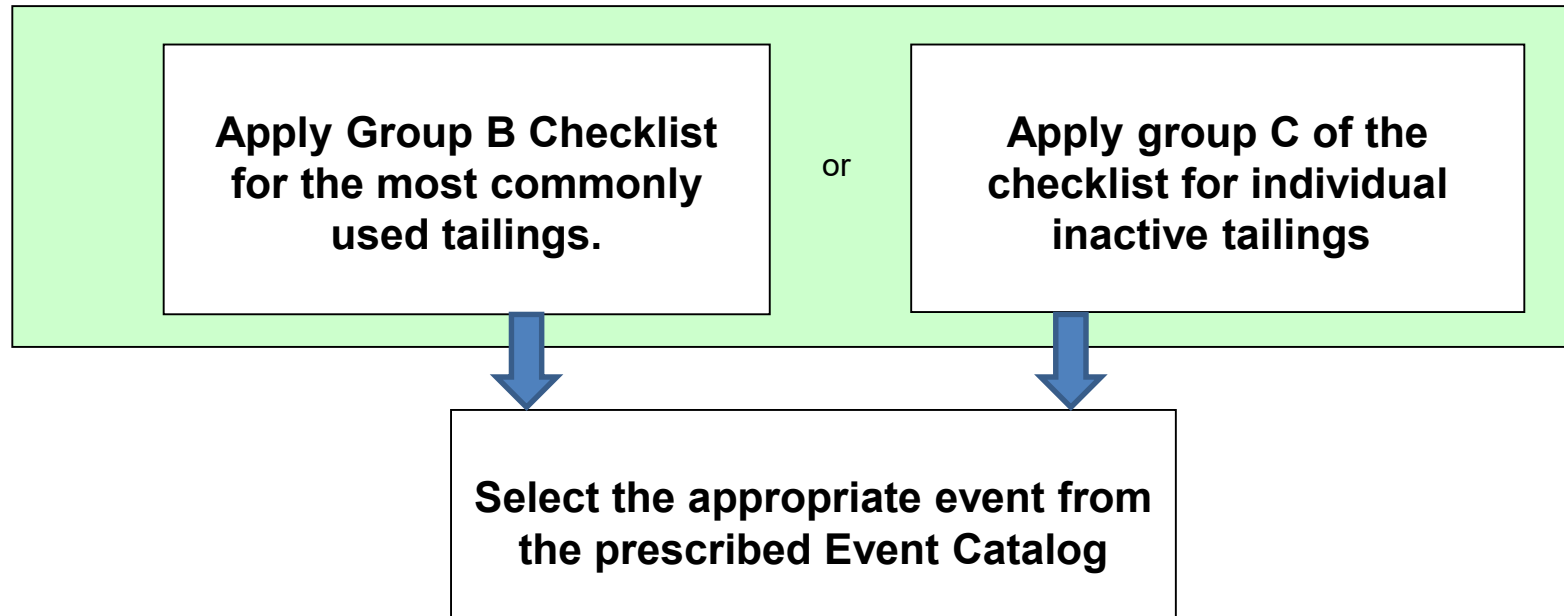
Application of the Checklist by state authorities



Results:

- national / regional tailing dump database, which ranks objects by their hazard / risk and tailing dump safety level
- Investment security enhancement programs

Application of the Checklist by State Inspectors and Tailings Operators



Results:

- - a detailed assessment of the safety level of the tailings
- investment programs to improve the safety of proven tailings

Thanks for attention!