



ARD RISK MANAGEMENT

AN INTEGRATED FRAMEWORK

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Introductory Comments

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- ▶ **Work in Progress** — Slides; Appendix; Paper to come
- ▶ Terminology
 - ▶ Is Prevention an objective, a strategic intent or an impossible dream?
 - ▶ Prevention of what – environmental damage or **residual risk \$\$\$**
 - ▶ Materiality is the focus. – aimed at sites with higher consequence risks.
 - ▶ **Design** of the **ARD Control System** (ACS)
 - ▶ Base method, mitigation measures, monitoring requirements, CCM
 - ▶ **Management of the ARD Control System**
 - ▶ That which must make the ACS Design work.

What Do I Want To Achieve?

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The objectives of my presentation are to build on the success of the GARD Guide by presenting:

- (1) Strategic objectives to guide the long-term development of an ARD Risk Management Framework.
- (2) A template for the Framework to serve as a start to its development.
- (3) An exploration of the meaning and sources of risk
- (4) Identify proactive actions for the short term.
- (5) Initiate a process leading to the aggressive development of an ARD Management Framework.

For you: Identify things to broaden your perspective; to think about, to talk about; and to do something about.

For Companies and Governments: A wake up call

What is Risk? A different Perspective

- ▶ Risk is a word that:
 - ▶ Is overused, misused and misinterpreted.
 - ▶ May mean nothing or portray a false sense of security.
- ▶ Risk is just a scary word to get you to:
 - ▶ Pay attention.
 - ▶ Think about how something might go wrong.
 - ▶ Identify the possible **consequences**.
 - ▶ Decide what more needs to be done.
- ▶ **BUT, how do we know if it is good enough?**

What is Risk-Based??

- ▶ GG Page 26: “The risk-based process aims to **quantify the long-term impacts of alternatives** and to use this knowledge to select the option that has the most desirable combination of attributes.”
- ▶ GG page 291: Alternates; List of Factors GG Page 291
 - **costs**, benefits, effectiveness, reliability and service life, sustainability, requirements for long term treatment and maintenance, acceptability to stakeholders, public and regulators, **risks**
- ▶ There is nothing in the above to suggest that risk is anything more than another factor (#7) and avoids any emphasis on consequences.
- ▶ Why not have a **principle-based process** that would start with designing to the level of minimum risk and then decide:
 - ▶ If the project economics justify proceeding, or
 - ▶ If a lower cost/higher risk alternative would be acceptable to all.

Need to Communicate Uncertainty & Risk

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- ▶ Not single values; Not expressions of risk
 - ▶ Possibility X Consequence – Meaningless
 - ▶ Management's Best Estimate – Hopeful Guess
 - ▶ Expected Value – Accounting Calculation
 - ▶ Most Likely – Educated Guess; It could be worse
- ▶ Report what the mining company is responsible for;
 - ▶ **RAR 1: Risk Reporting:** To support mining company and government risk-based decisions regarding new mine development and financial assurance, risks must be reported as a range of outcomes or **credible scenarios** expressed in \$ and physical terms.

Global Tailings Standard (2020)

Breach Analysis - A consequence example

“Develop and document a **breach analysis** for the tailings facility using a methodology that considers credible failure modes, site conditions, and the properties of the slurry. The results of the analysis shall estimate the physical area impacted by a potential failure. When flowable materials (water and liquefiable solids) are present at tailings facilities with Consequence Classification of ‘High’, ‘Very High’ or ‘Extreme’, **the results should include estimates of the physical area impacted by a potential failure, flow arrival times, depth and velocities, and depth of material deposition.**” (But, not the Number of people potentially affected.)

Why Are Adverse Consequences Possible?

What can go wrong (WCGW)

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Technical Uncertainty:

- ▶ Natural hazards.
- ▶ Technical predictions.

System Failures

- ▶ Structural failures – tailings ponds, waste dumps, **blended structures**
- ▶ **Human Factors** - Human judgements, decisions, actions and inactions
- ▶ Management – Inadequate **corporate oversight**; Cost-based decisions.
- ▶ Financial – Budget constraints; **Short-term expediencies**; Other priorities; Inadequate financial assurance; **Bankruptcy**; Sale of non-core properties
- ▶ Political – **inadequate due diligence**; weak oversight; lax permit requirements weak or inadequate financial assurance

WCGW - Human Risk Factors

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“The underlying **primary drivers of failure that often lead to inadequate risk management** are primarily due to:” (Oroville ITF Report, Appendix J)

(1) Ignorance

– not being sufficiently aware of risks,

(2) Complacency

– being sufficiently aware of risks but being overly risk tolerant.

Words – risk-based, encapsulation, safety, best practice

(3) Overconfidence

deal with them.

– being sufficiently aware of risks, over estimating ability to

(4) Irresponsibility

environmental/operating goals, wrong priorities

– unethical conduct, unprofessional conduct; conflicting

(5) Willful ignorance

makers to ignore the possibility of low probability and high consequence outcomes.

– the tendency of both corporate and government decisions

Lessons Learned

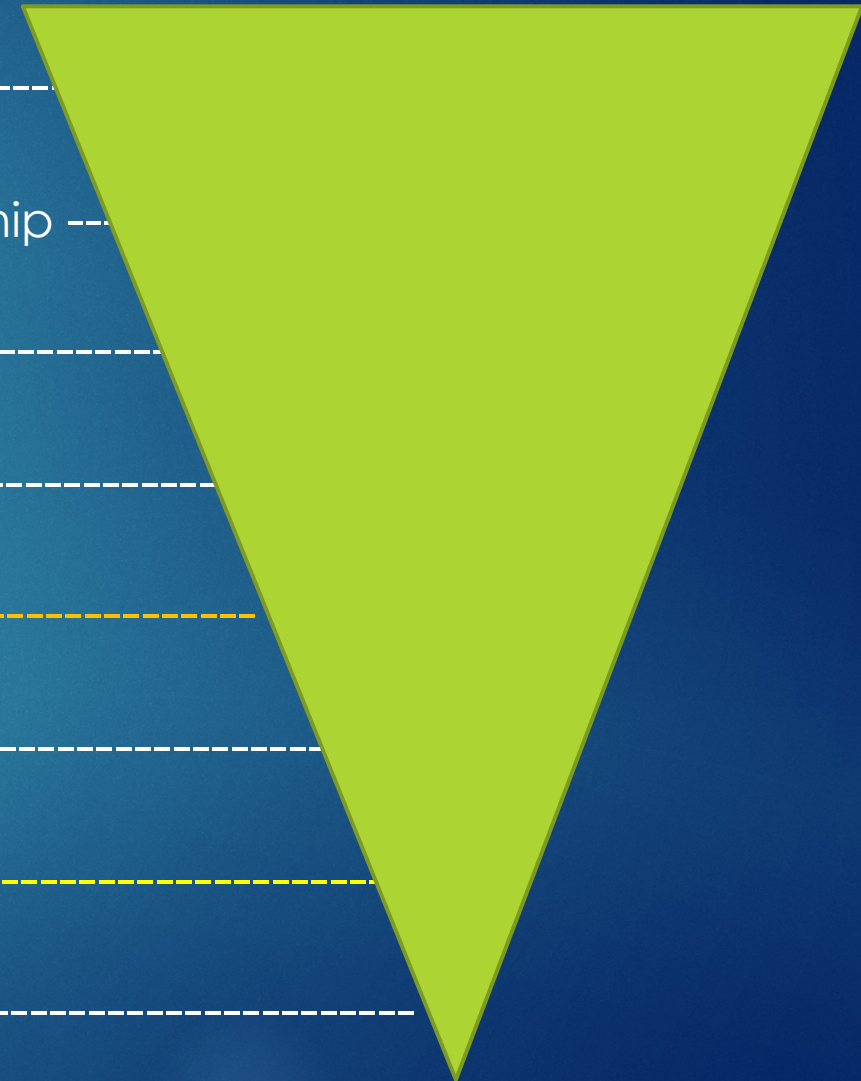
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- ▶ TAILINGS DISASTERS have shown the;
 - ▶ Importance of Directors and Executive Oversight - materiality
 - ▶ Need for Increased Technical Accountability – EOR
 - ▶ Need for Expert Independent Reviews – judgement/experience
 - ▶ Value of worse case studies or scenarios – get attention
- ▶ OROVILLE – Importance of Human Factors, Limitations of FMEA;
- ▶ CN CODE – Value of a comprehensive code, Transparency
- ▶ Disasters drive knee-jerk improvements which produce half measures (Best practices continue to be insufficient)
- ▶ Disconnect between \$ cost of original design detail vs many more \$\$\$ to study what went wrong after a disaster

Risk Reduction Scale (Effectiveness Levels)

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- ▶ PUBLIC ACCOUNTABILITY (Full Transparency)-----
- ▶ INDUSTRY ACCOUNTABILITY – Condition of membership ----
- ▶ INDEPENDENT VALIDATION/AUDITS/REVIEWS-----
- ▶ AUDIT PROTOCOLS (must have)-----
- ▶ MANAGEMENT STANDARDS-----
- ▶ TECHNICAL STANDARDS -----
- ▶ PRACTICE GUIDES – Gard Guide (33-34)-----
- ▶ BODY OF KNOWLEDGE -----



STRATEGIC INTENT

- ▶ DEVELOP AN ARD RISK MANAGEMENT FRAMEWORK THAT WILL BE ADOPTED AND USED BY ALL GOVERNMENTS AND ALL MINING COMPANIES, BIG AND SMALL, TO:

1. **ENABLE** THE MINING OF SULPHIDIC DEPOSITS IN A MANNER THAT:

- ▶ MAXIMIZES SUSTAINABLE CONTRIBUTIONS TO THE QUALITY OF HUMAN LIFE
- ▶ WHILE ENSURING THAT SOCIETY, THE ENVIRONMENT AND GOVERNMENTS ARE PROTECTED FROM THE POTENTIAL ADVERSE EFFECTS AND COSTS OF ACID MINE DRAINAGE.

Strategic Intent(Cont.)

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DEVELOP AN ARD RISK MANAGEMENT FRAMEWORK THAT WILL:

2. PROVIDE

- ▶ RELIABLE CHARACTERIZATION AND PREDICTION TECHNIQUES.
- ▶ EFFECTIVE PREVENTIVE DESIGN AND MITIGATING MEASURES.
- ▶ RESPONSIBLE PROFESSIONAL SUPPORT
- ▶ COMMITTED MINING COMPANY PRACTICES.
- ▶ INFORMED GOVERNMENT OVERSIGHT.
- ▶ INFORMED STAKEHOLDERS.

Prime Responsibility

Who makes the decisions?

- ▶ **MINING COMPANIES** – Responsible to Shareholders & Society/Gov't
 - ▶ Mining companies must be held accountable for their decisions to extract sulphidic materials and accept responsibility for the consequences that follow.
 - ▶ Mining companies have the responsibility to make **decisions** to develop sulphidic rock orebodies based on an understanding of the risks involved and, therefore, must accept responsibility to provide adequate financial assurance to cover the full range of possible outcomes.

Government Responsibilities

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- ▶ Governments have the responsibility to make **informed decisions** regarding high sulphidic projects based on a comprehensive approval process that proactively optimizes:
 - ▶ Contributions to its economy.
 - ▶ Economic and social benefits for its citizens.
 - ▶ Adverse ESG impacts and risks.
- ▶ To meet this responsibility, governments have the further responsibility to require a proponent to accept project specific **requirements and conditions**, including the amount and form of financial assurance that are based on governments' own risk tolerances related to possible environmental and social consequences left behind by failed or irresponsible companies.

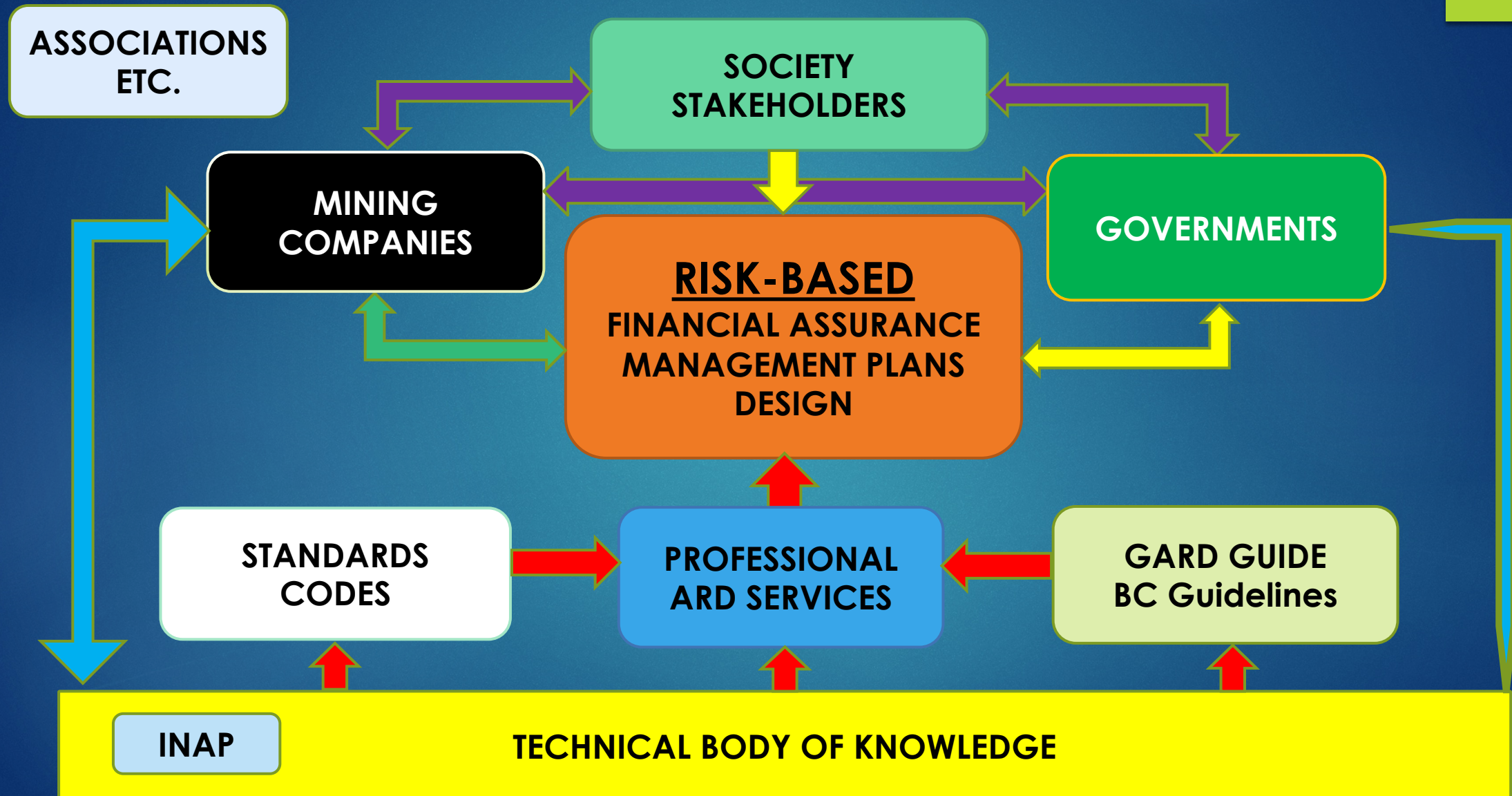
Supporting Responsibilities

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- ▶ **Qualified ARD Professionals** – design control system
 - ▶ *Responsible for design and prediction*
 - ▶ *Responsible for identifying and then communicating design specific risks to their clients or boss; (not just what they want to hear)*
- ▶ **INAP** – De facto technical leadership
 - ▶ Governments – Mend, Australia - Leading Practices Handbooks
- ▶ **PROFESSIONAL ORGANIZATIONS** – Geoscientists, Engineers, etc
- ▶ **MINING INDUSTRY ASSOCIATIONS** – ICMM, MAC, MCA. ETC - leadership needed
 - ▶ Physical and chemical stability are universally accepted closure principles.
- ▶ **OTHERS** – IFC, Investment community – role in highlighting material risks

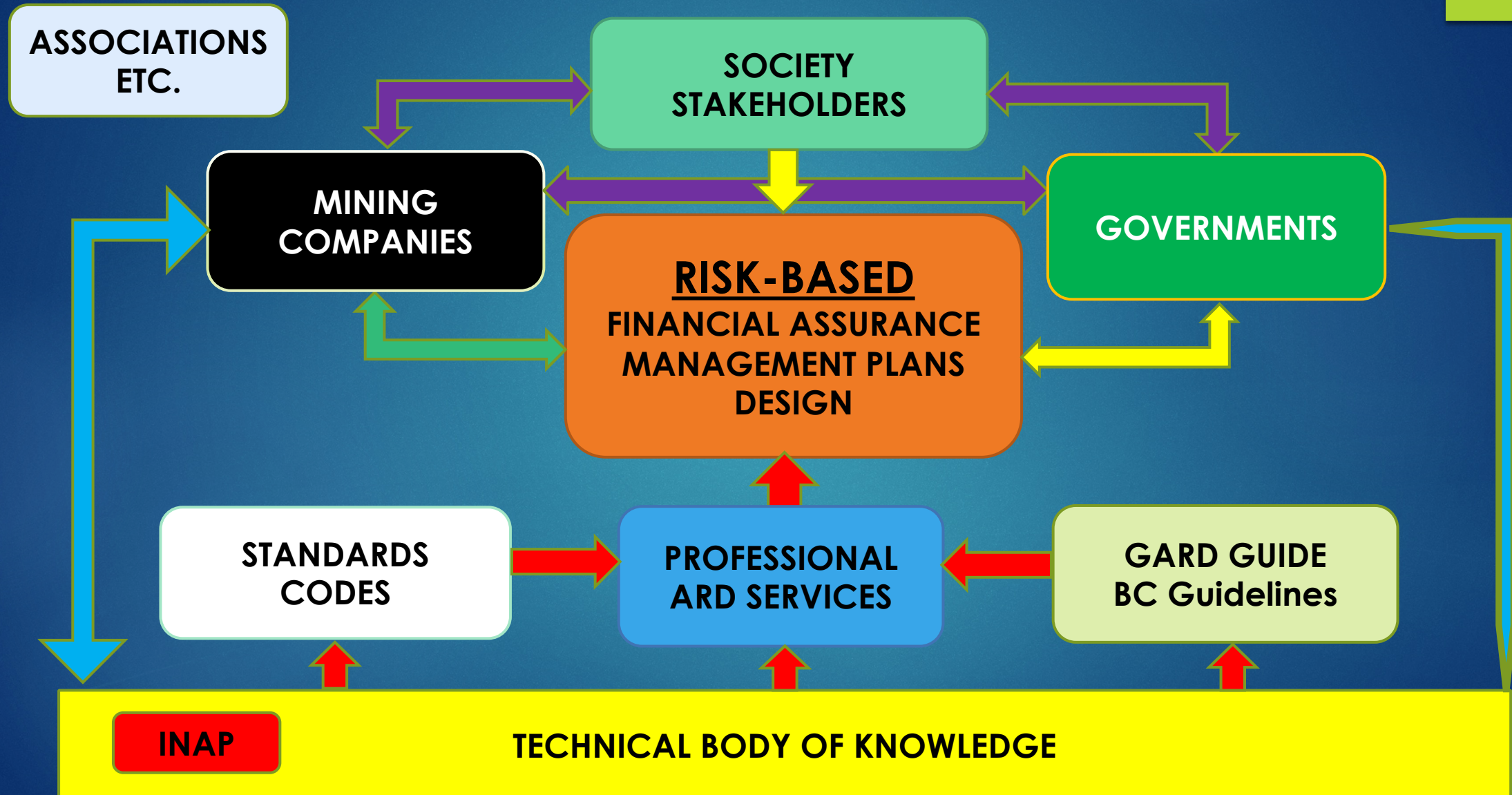
ARD RISK MANAGEMENT FRAMEWORK

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ARD RISK MANAGEMENT FRAMEWORK

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My priority actions would be: (Slide #)

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1. **MCR 1 & 2: Corporate Risk Governance (S20-21)**
2. **PSR 3: ARD Design Assurance Statement (S22)**
3. **GR 2: Independent Decision Making (S32)**
4. **GR 2 & 3: Government Decision Making & ARD Financial Assurance (S32-33)**
5. **RAR 1 & MCR 3: Risk Disclosure: Scenarios & Consequences (S14,31)**
6. **GGR 4: Demonstrated Practices (S40)**
7. **GG 5 & 6 Terminology – Rock Classification & Consequence Classification (S42-45)**
8. **GGR 2: ARD Professional of Record (S38)**
9. **RAR 2: Qualified Risk Professional (S28)**
10. **RAR 3: Risk Assessment Methodologies (S29)**

COMMITTED CORPORATE PRACTICES

(To be expanded)

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- ▶ **MCR 1: Corporate Risk Governance:** Corporations must have a risk management process that ensures material ARD risks are identified and are being adequately managed as part of a corporation's Executive and Board of Directors risk responsibilities.
- ▶ **MCR 2: Corporate Policy:** Leading practice requires that a company develop an ARD governance policy to be approved by its board of directors. The primary purpose of an ARD policy should be to demonstrate corporate commitment to a meaningful set of objectives and actions that would serve as the basis for the design and management of ARD facilities and the development of risk management strategies for material ARD projects.
- ▶ **MCR 3: Stakeholder Engagement:** Corporations must have a policies requiring constructive engagement with external stakeholders including the requirement to disclose the range of possible consequences associated with ARD.

MCR 2: ARD Governance Policy

See Appendix I

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- ▶ Acceptable Level of Protection
- ▶ Management System
- ▶ Risk Management
- ▶ Qualified ARD Professional, etc.
- ▶ Alternative Selection
- ▶ Risk Transparency
- ▶ Meaningful disclosure & engagement
- ▶ Financial Assurance
- ▶ Commitment review and validation
- ▶ Public Disclosure

ARD Characterization, Design and Prediction Report Assurance Statement - Appendix II

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GGR 3: ARD Design Assurance Statement (BC Characterization Guide)

- ▶ The ARD Professional of Record must provide a Site ARD Control Design Assurance Statement, stating: (Ref. EGBC, GG pg 401)
 - ▶ The ARD Professional's **qualifications** to direct such work. (p407)
 - ▶ That the dam site characterization work was completed in accordance with **current professional practice**;
 - ▶ That the **site characterization ,prediction** and supporting work is reasonably comprehensive and supports the design of the ARD control system as presented in the report.
 - ▶ That the potential **areas of uncertainty and system failure** identified during site characterization and prediction programs have been addressed, as far as is practical, in the design of the ARD Control Program
 - ▶ The **remaining risks** upon completion of the ARD Control Program design have been identified in the report and predictions for alternate credible scenarios have been developed for the assessment of ongoing risks.

INAP – Where to from here.

- ▶ Stay the same - Don't dilute technical focus.
 - ▶ But work on Terminology and Demonstrated Practices recommendations
- ▶ However, use as springboard for the development of an ARD Management Framework using expert multistakeholder sub-committees to start on priority issues by building on lessons learned from other high-risk initiatives and committed companies.
 - ▶ Characterization, design & prediction professional guideline. - **EGBC**
 - ▶ Corporate Policy – Appendix 1
 - ▶ Assurance Letter – EGBC, Aus. LP, GG p 401
 - ▶ Independent Reviews – MAC Tailings Protocols, Global Tailings Standard.
 - ▶ Design Assurance Statement – GGR 3 (22); Appendix 2; EGBC

▶ ICARD 2022

- ▶ Create forums for some of these priorities to help define a path forward for their development

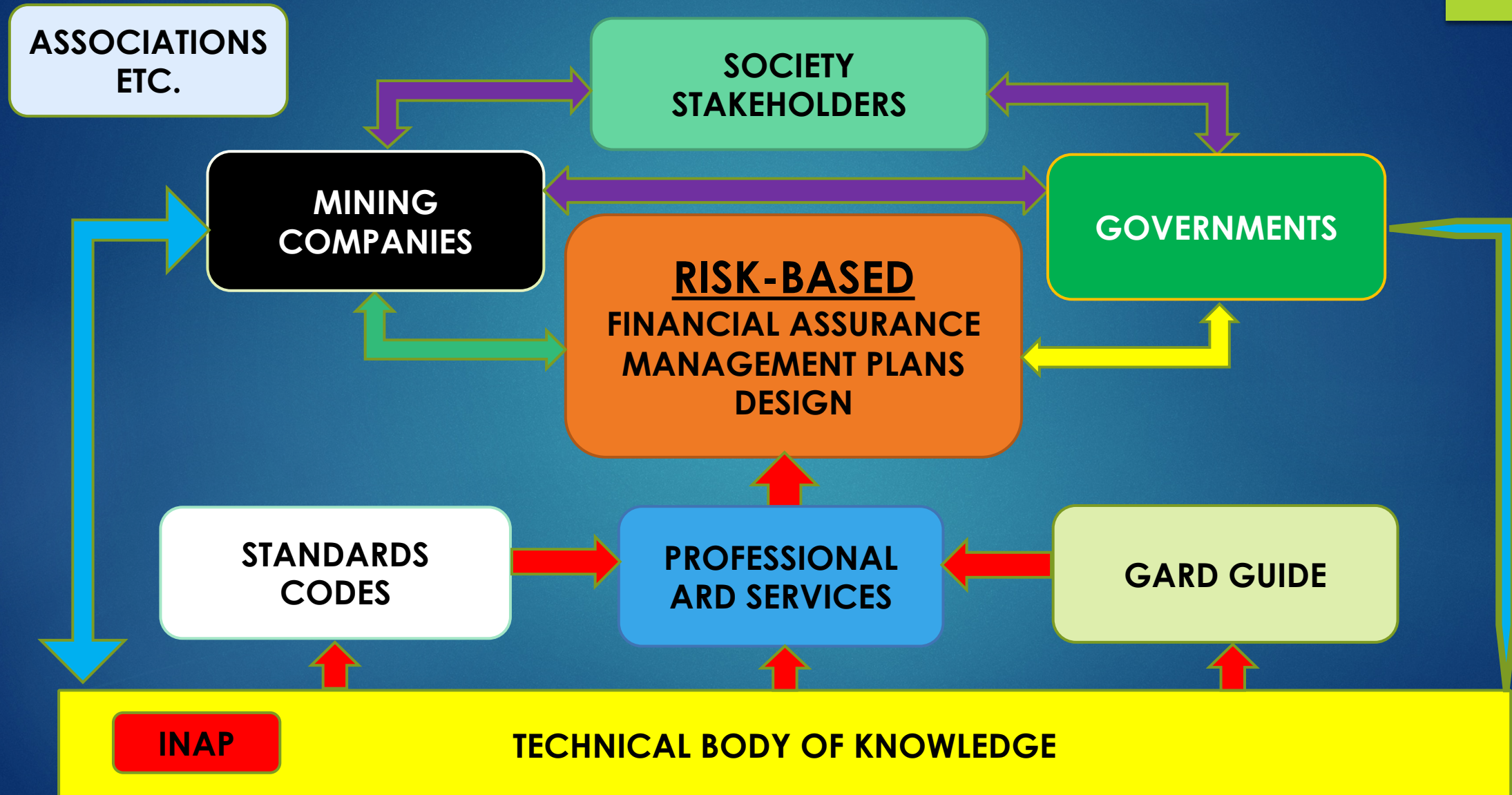
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ARD RISK MANAGEMENT FRAMEWORK

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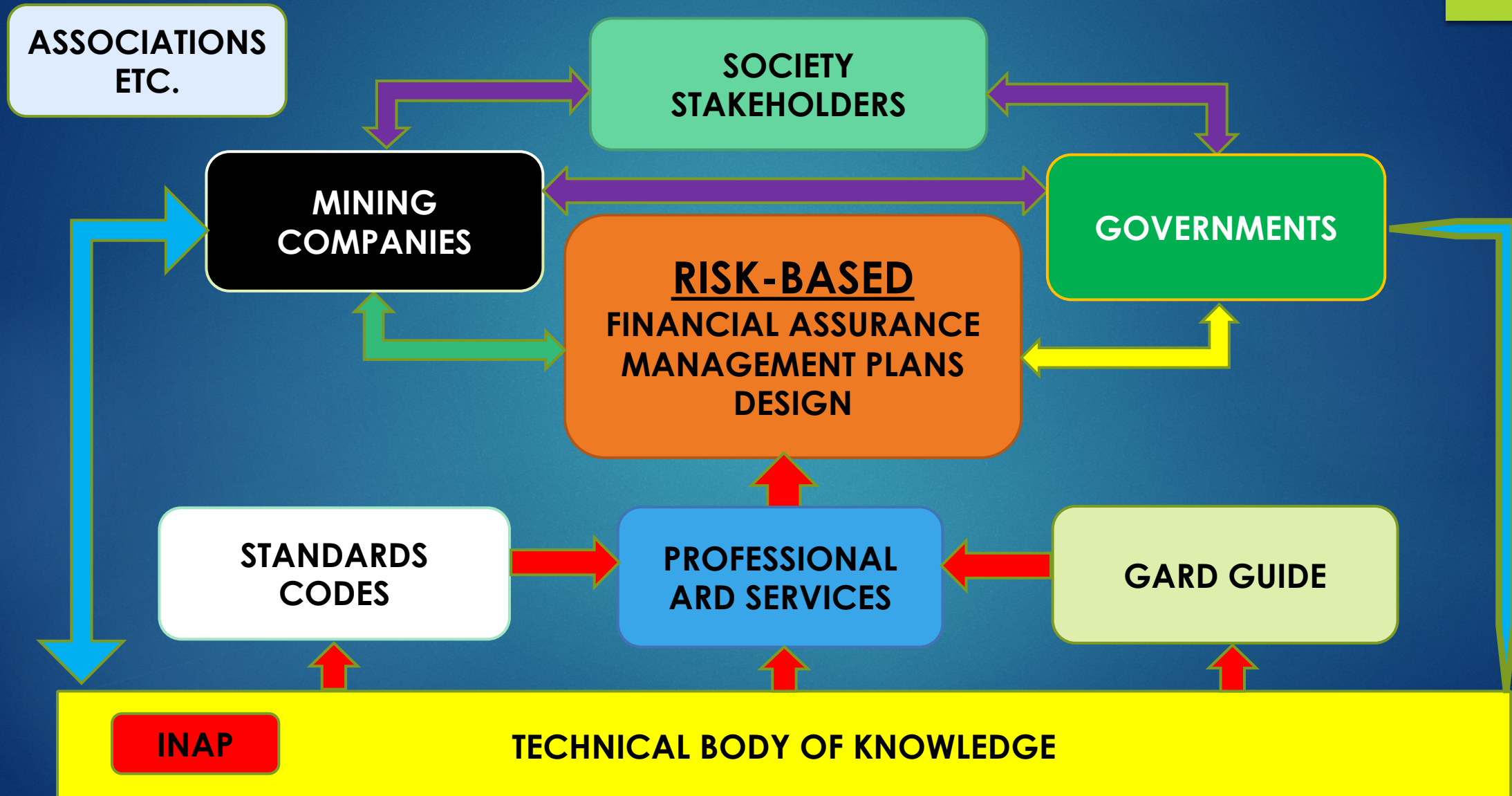
Homework

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- ▶ Independent Forensic Team Report for Oroville Dam Spillway Incident.
 - ▶ <https://damfailures.org/case-study/oroville-dam-california-2017/>
- ▶ Site Characterization for Dam Foundations in BC
 - ▶ <https://www.egbc.ca/app/Practice-Resources/Individual-Practice/Guidelines-Advisories>
- ▶ Root Cause Analysis - Investigation Report of the Chief Inspector of Mines (PDF, 10MB)
 - ▶ <https://www2.gov.bc.ca/gov/content/industry/mineral-exploration-mining/further-information/directives-alerts-incident-information/incident-information/mount-polley-tailings-breach/mount-polley-investigation>
- ▶ Global Industry Standard on Tailings Management (GIS)
 - ▶ <http://www.icmm.com/tailings-standard>

ARD RISK MANAGEMENT FRAMEWORK

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Risk Assessment Practice

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What it is not:

- ▶ Risk assessments are not just an exercise focusing on the technical uncertainties underlying the system design.

Risk Assessment Process: What is needed is an assessment process that:

- ▶ Is also about human, economic and other factors that cause things to go wrong led by “an effective facilitator” “trained and skilled in the process” of risk assessment. (Ref. Aus LP p 65-66)
- ▶ **RAR 2: Qualified Risk Professional:** Approval decisions must be led by a **qualified risk professional** with “...demonstrated ability to lead a process of complex human interactions reflecting the need to bring expertise to bear while guiding thorough, critical and constructive interactions among team members related to group judgment and decision-making.” (Ref: Oroville IFT p389/390)

What does Risk Assessment mean?

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- ▶ Four main purposes; Different needs: – Alternate control schemes, Project approvals, Financial Assurance, Critical controls
- ▶ Alternative Control Schemes: FMEA may be good enough if done right by the right people in the right way.
- ▶ However, for corporate project approvals and financial assurance it:
 - ▶ Presents difficulties in properly characterizing risks for large or complex syst
 - ▶ Creates a tendency to oversimplify complex failure modes
 - ▶ May not explicitly consider broader human and organizational factors
 - ▶ Ref: Oroville study

RAR 3: Risk Assessment Methodologies: Complex methodologies are needed to handle complex failure modes, human factors, project approvals and financial assurance. (Not: Go figure it out)

COMMITTED MINING COMPANY PRACTICES

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What Could Go Wrong - Corporate

A mine proponent must demonstrate that they have the necessary understanding, site capacity, technical capability, resources and intent to operate a mine in a manner which protects the environment. (Price, 1998, p7)

- ▶ Level of corporate and/or site commitment
- ▶ Inadequate risk oversight
- ▶ **Inadequate funds** provided for “risk-based” planning and design
- ▶ Conflicting organizational goals – personal & financial
- ▶ Short-term expediencies. – cost pressures; discount rate effect;
- ▶ Inadequate financial assurance
 - ▶ “Expected Value”, Discount rate, unsecured funds
- ▶ **Economic**
 - ▶ Bankruptcy,
 - ▶ Sale of non-core properties

COMMITTED CORPORATE PRACTICES

(To be expanded)

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- ▶ **MCR 1: Corporate Risk Governance:** Corporations must have a risk management process that ensures material ARD risks are identified and are being adequately managed as part of a corporation's Executive and Board of Directors risk responsibilities.
- ▶ **MCR 2: Corporate Policy:** Leading practice requires that a company develop an ARD governance policy to be approved by its board of directors. The primary purpose of an ARD should be to demonstrate corporate commitment to a meaningful set of objectives and actions that would serve as the basis for the design and management of ARD facilities and the development of risk management strategies.
- ▶ **MCR 3: Stakeholder Engagement:** Corporations must have a policies requiring constructive engagement with external stakeholders including the requirement to disclose range of possible consequences associated with ARD.

Informed Government Oversight

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GR 1: Approval Process (Principle): Governments must have a comprehensive approval process that proactively optimizes;

- ▶ Contributions to its economy.
- ▶ Economic and social benefits for its citizens
- ▶ Adverse ESG impacts and risks.

GR 2: Independent Decision Making: Approval of the ARD Control Plan, including additional risk reduction requirements, must be based on Government having a thorough understanding of the risks involved, obtained, if necessary, through the engagement of its own independent Qualified ARD Professional Advisor retained at the proponent's expense.

Informed Government Oversight

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GR 3: ARD Financial Assurance: Government must establish, for each mine, the amount and security of financial assurance it requires based on:

- ▶ **Its own comprehensive risk assessments** that address technical, human, management and economic risks related to the control plan.
- ▶ **Its own risk assessments and risk tolerances** related to the financial capability of the proponent.
- ▶ **Independent assurance** that the stipulated financial provision is up to date, independently guaranteed, accessible in the relevant timeframe, and sufficient to cover ongoing closure costs. (contingent liability?)

GR4: Ownership Changes: Government must ensure that any transfer of title or ownership changes are not allowed to proceed without reassessment of the amount and security of the financial assurance security.

GR5: Stakeholders: Government decisions must reflect the opinions gained through an informed and reasoned stakeholder public engagement program.

Strategic Intent Professional Services

- ▶ **RELIABLE** CHARACTERIZATION AND PREDICTION TECHNIQUES.
- ▶ **EFFECTIVE** PREVENTIVE AND MITIGATING MEASURES.
- ▶ **RESPONSIBLE** PROFESSIONAL SUPPORT
- ▶ Need to give Government and Mining Companies the tools they need to meet their responsibilities.

The Gard Guide

What it is. What it is not.

- ▶ Its name says it is a Guide.
- ▶ BUT “
 - ▶ The “Guide” states on page 16 that it is “...not intended to be guidance or authority to any person or entity specific to any project of any nature...” p16
 - ▶ “...seek out the guidance of a professional engineer or other qualified professional consultant for assistance...”
- ▶ HOWEVER,
 - ▶ It seems to do a very good job of describing what a guide should provide regarding characterization, prediction, treatment and monitoring
 - ▶ It also identifies the importance some of the non-technical requirements such as management systems and communications
 - ▶ IT IS THE BEST WE HAVE
 - ▶ WHATEVER IT IS, WE NEED SOMETHING STRONGER TO DRIVE ITS ADOPTION

Strategic Intent

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- ▶ **RELIABLE** CHARACTERIZATION AND PREDICTION TECHNIQUES.
- ▶ **EFFECTIVE** PREVENTIVE AND MITIGATING MEASURES.
- ▶ **GGR 1: Use the Gard Guide as the basis for a Characterization, Design and Prediction Standard:**
- ▶ NEEDS TO BE RECAST IN A FORM THAT PROVIDES TECHNICAL STANDARDS THAT CAN BE DESCRIBED IN A MANNER THAT THEIR ADOPTION CAN BE IDENTIFIED, **VALIDATED** AND PUBLICALLY REPORTED
- ▶ Needs to be recast in a form that Mining Companies have to consider and address.

To be effective suggested improvements are :

- ▶ ARD professional support – POR, Professional Guidance, Assurance Letter
- ▶ Demonstrated practices - Revisit adjectives used for each practice
- ▶ Risk assessment methodology – FMEA (good overview but simplistic)
- ▶ Risk assessment process – Qualified Risk Professional
- ▶ Sulphidic rock storage structures – integrity/risk (dams/dumps/hybrid)
- ▶ Risk communication – more specific guidance re consequences/scenarios
- ▶ Terminology – rock potential classification; closure consequences

GGR 2: ARD Professional of Record (ARD POR)

- ▶ An ARD Professional of Record must be appointed for each project to be responsible for all aspects of the characterization, design and prediction programs required to support the development of an ARD Control Plan.
- ▶ Define the role of the ARD Professional of Record in terms of her/his contributions to the comprehensive requirements of an ARD control system design, its management program, the submission of an **assurance letter** and other activities required to adequately assist a client in meeting its responsibilities. (ref. p401; GG)
- ▶ Longer term: Develop Professional Practice ARD Guidelines
 - ▶ Reference; [Site Characterization for Dam Foundations in BC](#)
 - ▶ Process & Personal Conduct – human factors

ARD Characterization, Design and Prediction Report Assurance Statement

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GGR 4 - Best vs Demonstrated Practices

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- ▶ The only general method that can be called a best practice is water cover or not mining at all.
- ▶ All the other “Best Practice Methods” have important risks or drawbacks as inferred by the following terms used in the Gard Guide:
 - ▶ Limitations
 - ▶ Disadvantages
 - ▶ Potential Considerations/Concerns
 - ▶ Contingencies

GGR 4: Demonstrated Practices: Most Best Practices in the Gard Guide must be referred to only as “Demonstrated Practices” with clear listing of their potential risks as a guide to the identification, analysis and reporting of site-specific risks and be defined in a manner that their application can be identified, validated and publicly reported.

“The bottom line is that existing self-identified good and best practices have failed to prevent catastrophic dam failures and more progress is required. Furthermore, the more general the description of a practice, the easier it is for the less committed to claim they have adopted it.” (Brehaut TMW 2017)

GGR 4: Practices – Other terms

More Honest Designations

- ▶ Required Practices
- ▶ Responsible Practices
- ▶ Precautionary Practices
- ▶ Good Practices
- ▶ Leadership Practices – defined in a manner that their application can be identified, validated and publicly reported.
- ▶ Best Practices – best of a bad lot but still not good enough
- ▶ Also need to be defined in a manner that their application can be identified, validated and publicly reported.

GGR 5: Rock Classification

GARD GUIDE Example – page 173

- ▶ • High potential for acid generation- Category 1 (AG1).
 - ▶ • Moderate/high potential for acid generation - Category 2 (AG2).
 - ▶ • Moderate potential for acid generation- Category 3 (AG3).
 - ▶ • Low potential for acid generation- Category 4 (AG4).
 - ▶ • Unlikely to be acid generating (UAG).
 - ▶ • Likely to be acid consuming (LAC).
 - ▶ • inconsistent data (ID).
-
- ▶ GGR 5: Develop an ARD rock classification similar in intent to the example above from the Gard Guide.

Precautionary Practices

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CONSEQUENCES	Rock & Tailings Classification	Segregation	Storage Location	Financial Assurance	
No Potential	Y			EXPECTED	
Manageable	Y	Maybe		Expected +	
-No Treatment				Cont. Plan	
High	Y	Y	Y	Expected	
- WT				++	
Very High	Y	Y	Y	Worst Case	
Extreme	Y	YY	YY	Worst Case	
Do not mine					

GGR 6: Terminology

Consequence Classification

GGR 6: ARD Risk Consequence Classification: Develop a rating criteria similar in intent to the Global Tailings Standard below.

Classification

- ▶ Low
- ▶ Significant
- ▶ High
- ▶ Very High
- ▶ Extreme

ARD Rating Criteria

- ▶ -----
- ▶ No potential for ARD
- ▶ Low potential
- ▶ High Potential
- ▶ Very High potential

Consequence Rating – Some Ideas

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CONSEQUENCE OF ARD SYSTEM FAILURE	AG Potential (Rock)	Water Treatment Post Closure	Method Integrity	Other Factors	Financial Assurance Required
None	Unlikely		High		Expected
			(Low risk)		
Low	Low		Manageable		Expected +
			No treatment		Cont. Plan
High	Medium	10-100	Proven Tech		Negotiated
			Water Treat.		
Very High	High	100 plus	Demo Tech		Worst Case
			Water Treat. +		
Extreme (Do not mine)	High	100 plus	Unreliable		None

Informed Stakeholders

Stakeholder Engagement

In order to establish a climate of **credibility and trust**, companies and stakeholders must engage in a process based on **informed opinions** and reasoned debate. To establish a trusting climate, it is recommended that;

- ▶ **SR1: Transparency:** Companies must inform the public of the nature of the ARD related risks at proposed and existing facilities.
- ▶ **SR2: Meaningful Engagement:** Companies must commit to provide the public with the opportunity to participate, in a collaborative manner, and influence the decisions that affect them.
- ▶ **SR3: Stakeholder Commitment to Reasoned Comment:** Public stakeholders must use the opportunity to be informed and to participate in a reasoned manner.

Public Engagement

Selected Quotes

- ▶ When the public...are fully informed and participate in decision-making related to the public interest. (WMI 1993)
- ▶ Meaningful Engagement provides the public with the opportunity to participate in and influence decisions that may affect them. (MAC 2015)
- ▶ A 'social licence to operate' can only be earned ...by incorporating meaningful consultation with...host communities. (AUS LP 2016)

Equity Silver

Leading Practices 1988-1891

- ▶ Responsible, well financed ownership
- ▶ Secure financial assurance based on worst case
- ▶ High level of ARD expertize from 1990 onward for all successive owners. (Equity, Placer Dome, Goldcorp, Newmont)
- ▶ High level expertize within government ranks
- ▶ Engaged and informed public
- ▶ The “Equity Mine Financial Security Technical Advisory Group” (EMFSTAG) with representatives from MEM, MOE, Equity and local public and First Nations groups.
- ▶ Annual ARD (environmental) reports.
- ▶ Focus on continuous learning – monitoring, performance assessment and continuous improvement

But: Despite our best intentions, we still fell short on Financial Assurance

ARD RISK MANAGEMENT FRAMEWORK

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