A New ERAA
Regulatory Proposal for Integrating Hydrogen, Ammonia and Methanol into Energy Resource Regulation in British Columbia

Focused Engagement | Q4 2024

BRITISH COLUMBIA **ENERGY REGULATOR**

We acknowledge and respect the many First Nations, each with unique cultures, languages, legal traditions and relationships to the land and water, on whose territories the British Columbia Energy Regulator's work spans.

Agenda

01 Introductions and Meeting Objectives

02 Proposed regulatory policies - rationale

03 Re- Application and Application requirements

04 Engineering requirements

05 General, safety and monitoring requirements

06 Environmental requirements

07 Security management requirements

08 Emergency management requirements

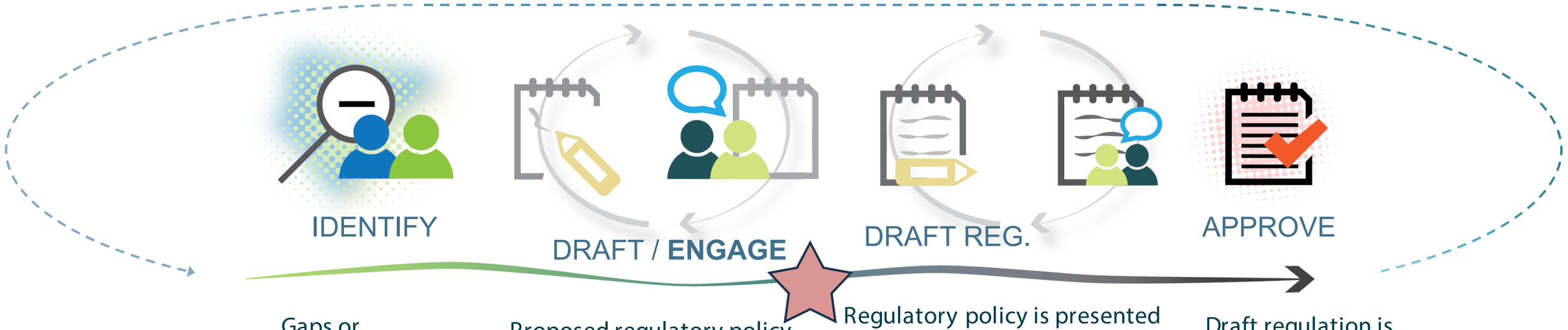
09 Administrative requirements

10 Next steps

Regulatory Development Update & Next Steps

This presentation will summarize changes to regulatory policy made following feedback from the policy shared in August.

- The BCER has updated policies for consultation and notification, engineering, environmental management and other areas in response to the feedback received.
- The goal is to develop a stand-alone hydrogen regulation and new guidance materials specific to hydrogen projects.



Gaps or opportunities for improvement

Proposed regulatory policy is shared with FNs & stakeholders for input and suggestions when appropriate.

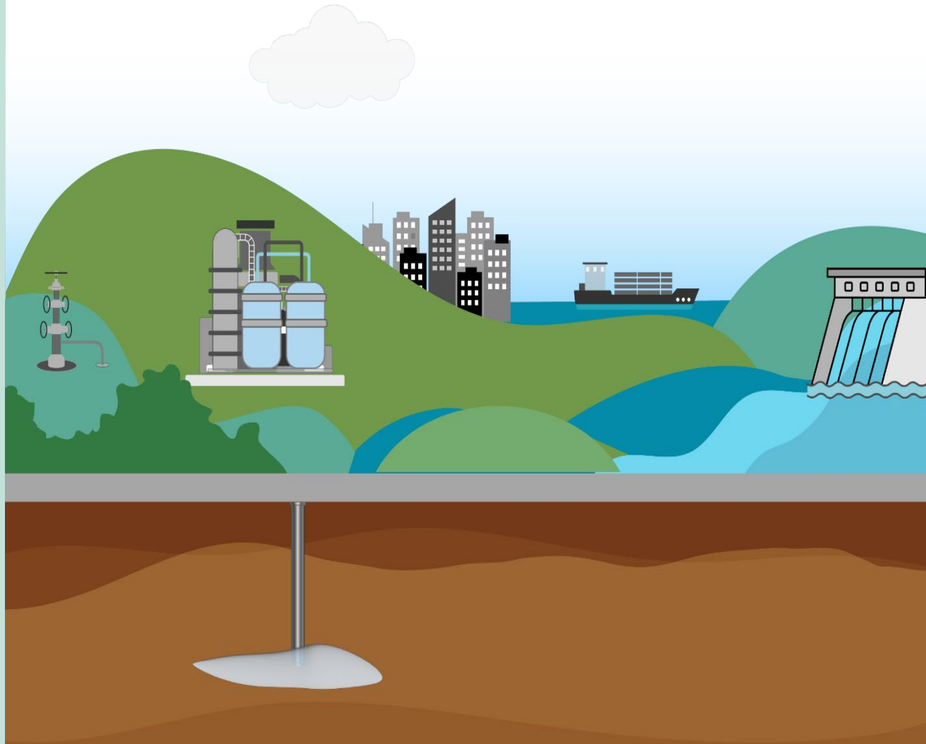
Regulatory policy is presented to Board and if approved, goes to drafting. Changes in policy may be shared back with FNs & stakeholders for further discussion.

Draft regulation is presented to the Board. If passed by the Board, regulations are implemented.

Rationale for Proposed Regulatory Proposals – What We Heard

Address risks and impacts based on scale and complexity of a facility: In B.C., based on existing or proposed projects typical characteristics for a project might include:

- Located in urban areas already zoned for commercial/industrial use:
  - Subject to municipal review/permitting requirements
  - Will use municipal water supply and not require Water Sustainability Act permits
  - Waste produced will likely meet criteria for discharge into municipal sewers and not require Environmental Management Act (EMA) permits
  - Emissions likely limited to oxygen and hydrogen and not require EMA permits
  - Minimal or no ground disturbance due to new construction
  - Relatively small project footprint
  - Located inside already constructed buildings
- Located in both urban and rural settings with larger facilities where hydrogen is likely produced and co-located with a facility where the hydrogen will be used at site.
- Larger more complex facilities, potentially where the hydrogen is converted to ammonia or methanol for transport internationally.
  - The Oil and Gas Processing Facility Regulation (OGPFR) provides an appropriate framework for regulating the full life cycle of this type of facility.



Rationale for Proposed Regulatory Proposals – Hydrogen

Considerations: B.C.'s context for an emerging hydrogen industry:

- Eliminating redundancy with jurisdictions having authority.
- Aligning with government direction on permitting efficiency.
- Using the existing tools within ERAA for carrying out an energy resource activity.

Threshold: Set scalable regulatory provisions for the manufacture of hydrogen based on consideration of:

- Amount of hydrogen on-site which serves as a proxy for risk impacts.
- Potential for hydrogen manufacturing pathway to create off-site impacts.

Proposal: The proposed threshold of 4.5 tonnes of hydrogen located at the facility (aggregate weight includes hydrogen in storage tanks and hydrogen in process equipment and piping) is informed by triggers for increasing regulatory oversight in other jurisdictional frameworks :

- Risk management (e.g. Process Safety Management, Control of Major Accident Hazards)
- Environmental assessment (e.g. B.C.'s Reviewable Projects Regulation)

Classes: Establish three classes of hydrogen manufacturing facilities:

- **"Class 1 Hydrogen Facility"** means a hydrogen facility:
  a) where the aggregate weight of hydrogen at the facility site is less than 4.5 tonnes, and
  b) that is not co-located with a facility for manufacturing ammonia or methanol.

- **"Class 2 Hydrogen Facility"** means a hydrogen facility:
  a) where the aggregate weight of hydrogen at the facility site is equal to or more than 4.5 tonnes,
  b) with a capacity to produce less than 100,000 tonnes of hydrogen per year, and
  c) that is not co-located with a facility for manufacturing ammonia or methanol

- "**Class 3 Hydrogen Facility"** means a hydrogen facility :
  a) that has a capacity to produce 100,000 tonnes or more of hydrogen per year, or
  b) is co-located with a facility for manufacturing ammonia or methanol.

Proposed Regulatory Proposals – Hydrogen, Ammonia and Methanol

Scope: Regulatory proposals cover a facility for manufacturing hydrogen, ammonia or methanol from petroleum, natural gas, water or another substance.

Approach: Continue to set transparent expectations and incorporate flexibility through a mix of prescriptive requirements and outcome-based requirements. Adopt a risk–informed approach through the adoption of nationally recognized standards, and a Professional Reliance Model.

Proposal for "Class 1 and 2 Hydrogen Facility": Create a stand-alone regulation and dedicated Guidance materials that incorporate the life-cycle activities associated with a facility.

- **"Class 1":** Adopts a professional declaration process with a simplified application and permitting process.
- **"Class 2":** Scalable requirements to adapt regulatory requirements appropriately to the complexity of a facility.

Proposal for "Class 3" Methanol and Ammonia Facility: Integrate into the current regulatory framework for processing facilities and other applicable Board regulations.

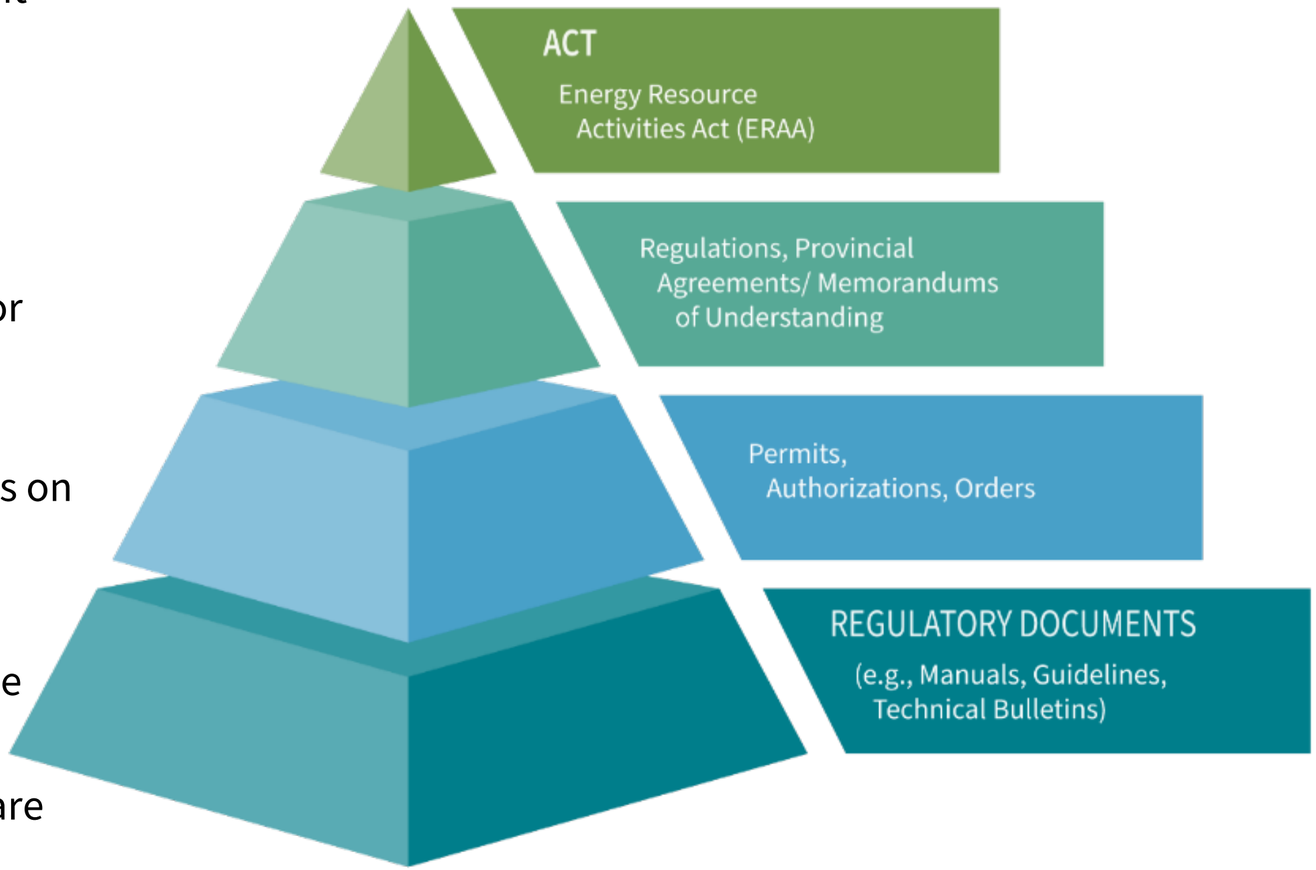
The BCER expects project proponents and permit holders to identify, be aware of and comply with applicable federal, provincial and municipal laws and regulations.

Application and Pre-Application Requirements

Intent: Information to be submitted or maintained by an applicant must provide adequate information to enable adjudication by a statutory decision-maker, where required.

Initially, requirements will strive to:

- Minimize or eliminate redundancy with applicable standards, or codes, as well as federal, provincial, municipal laws and regulations.
- Ensure transparency and consistency of Regulator expectations on adequacy of information for project proponents.
- Clearly distinguish information to be submitted vs maintained.
- Minimize the use of exemptions where a project's scope or scale may not require specific aspects of application information.
- Continue to be monitored to determine where improvements are needed.



The BCER's regulatory framework also consists of requirements outlined in ERAA and supporting Regulatory Documents.

Pre-Application Requirements - Consultation and Notification

Intent: Set clear timelines and requirements that enable flexibility in approaches to ensure persons or bodies who may be potentially impacted by a proposed project can be informed and share concerns.

- **Class 1 Hydrogen Facility:** No prescribed requirement for consultation and notification.
- **Class 2 Hydrogen Facility:**
  - Require an applicant to determine if a person, rightsholder or body can reasonably be expected to face impacts due to a proposed activity and provide notification in a form the applicant deems most practicable. The notification must include:
    - A clear summary of the timing, nature, and extent of impacts; business name and contact information; address of proposed activities; 30-day response timeline for outlining concerns and the ability to submit concerns to the BCER.
  - Require an applicant to prepare a written report summarizing:
    - The persons or bodies who were notified of the proposed activity
    - The methods used to notify impacted persons or bodies and rationale for use of this method
    - Comments received from notified parties
    - How comments or concerns were accommodated or considered by the applicant
  - Establish notification requirements for revision of an approved application
  - Establish requirements for service of documents

Application Requirements - Engineering

An applicant must ensure the necessary engineering work is completed and requirements stipulate where these must be submitted (S) vs maintained (M).

Application Requirements	Class 1	Class 2
A project description	**S& M**	**S& M**
A construction schedule	**S& M**	**S& M**
A Statement from Engineer of Record: • Declares which design standard (CAN/BNQ 1784-000, or NFPA Code 2) was followed; • Specifies deviations from the design standard; • Specifies which hazard studies and risk studies have been completed in accordance with professional practice and confirms whether the engineering design incorporated any and all recommendations; • Confirms whether the proposed project was designed in accordance with adopted standards, codes and applicable regulations; and • Confirms all engineering design documents have been completed in accordance with Engineers and Geoscientists British Columbia professional practice requirements.	**S& M**	**S& M**
Engineering design documents, Hazard study reports, and Risk study	**M**	**S& M**

Application Requirements - Environment

The BCER expects project proponents and permit holders to identify, be aware of and comply with applicable federal, provincial and municipal laws and regulations.

- Under the BCER's single-window model, issuance of approvals, permits, and/or licenses under Specified Enactments may be triggered by a proposed project.

Application Requirements	Class 1	Class 2
• A report in the form and manner the Regulator requires on the assessment of environmental effects respecting the applicant's proposed class 2 facility completed by a Qualified Professional. • Where identified by the assessment, include details on the measures required to minimize the adverse effect the facility could have on the environment during construction, testing, normal operation, abnormal operation / upsets, suspension of the facility and decommissioning of the facility.	**N**	**Y**

BCER will monitor and may need to respond to new and emerging environmental requirements.

Engineering Oversight

Intent: The BCER's approach to decisions regarding the management of risk to the public, the environment and infrastructure is to require design, construction and operation of the facility be conducted in a manner consistent with recognized and generally accepted good engineering practice and supported by a Professional Reliance model.

Key Elements of Engineering Oversight	Class 1	Class 2
Qualified Professional as defined under Professional Governance Act require engineering information be submitted to be signed-off	**Y**	**Y**
Codes and Standards: design, construct and operate a facility in accordance with either: • **CAN/BNQ 1784-000** means the Canadian Hydrogen Installation Code , or • **NFPA 2** means Hydrogen Technologies Code	**Y**	**Y**
Integrity Management Plan: Require a Qualified Professional develop, implement and maintain an Integrity Management Program when designing, constructing, operating, suspending and decommissioning a hydrogen facility.	**Y**	**Y**
Facility changes: Ensure a Qualified Professional undertakes hazard and risk assessments prior to facility changes. And, where hazard or risk reduction measures are necessary ensures they are implemented by the permit holder.	**Y**	**Y**
CSA Z767: Require class 2 hydrogen facility to have a process safety management system.	**N**	**Y**

General and Safety Requirements

Intent: Prescribe standard conditions to raise awareness of hazards, minimize nuisance issues, establish good housekeeping, and reinforce safe practices where an activity presents risks to the safety of persons or the environment.

- Require Class 1 and Class 2 Hydrogen Facilities to be:
  - Designed, sited, constructed, operated, suspended and decommissioned; consistent with the approved application and in accordance with codes and standards, and recognized and generally accepted good engineering practices.
  - Be constructed and operated in accordance with the engineering design.
- Maintain up-to-date and detailed drawings of the facility, including piping and instrumentation diagrams, electrical line diagrams, plot plans, and a list of all safety critical devices.
  - Submit to the Regulator record drawings of the facility including piping and instrumentation diagrams, electrical line diagrams, plot plans, and a list of all safety critical devices within three months of beginning operation (or completing permitted modifications, if applicable).

- Require permit holder to:
  - Not bypass or disable the function of a safety critical device unless certain conditions are met.
  - Lock or car seal any valve or device that can bypass or disable the function of a safety critical device.
  - Develop, maintain and implement safe-work procedures for all tasks that present risks to the safety of persons or that may be detrimental to the environment.
  - Ensure all actions necessary to rectify the situation are taken as soon as practicable if containment or process control is lost or compromised.
  - Maintain the facility in a condition that minimizes hazards.
  - Post along the boundaries of its facility signs indicating: the name of the permit holder, emergency notification information, including a telephone number, and street address or legal site description, as applicable.

Monitoring Requirements

Intent: Establish minimum monitoring requirements for attended and unattended facilities to ensure adequate warning, alarm and shutdown capability is in place for the facility.

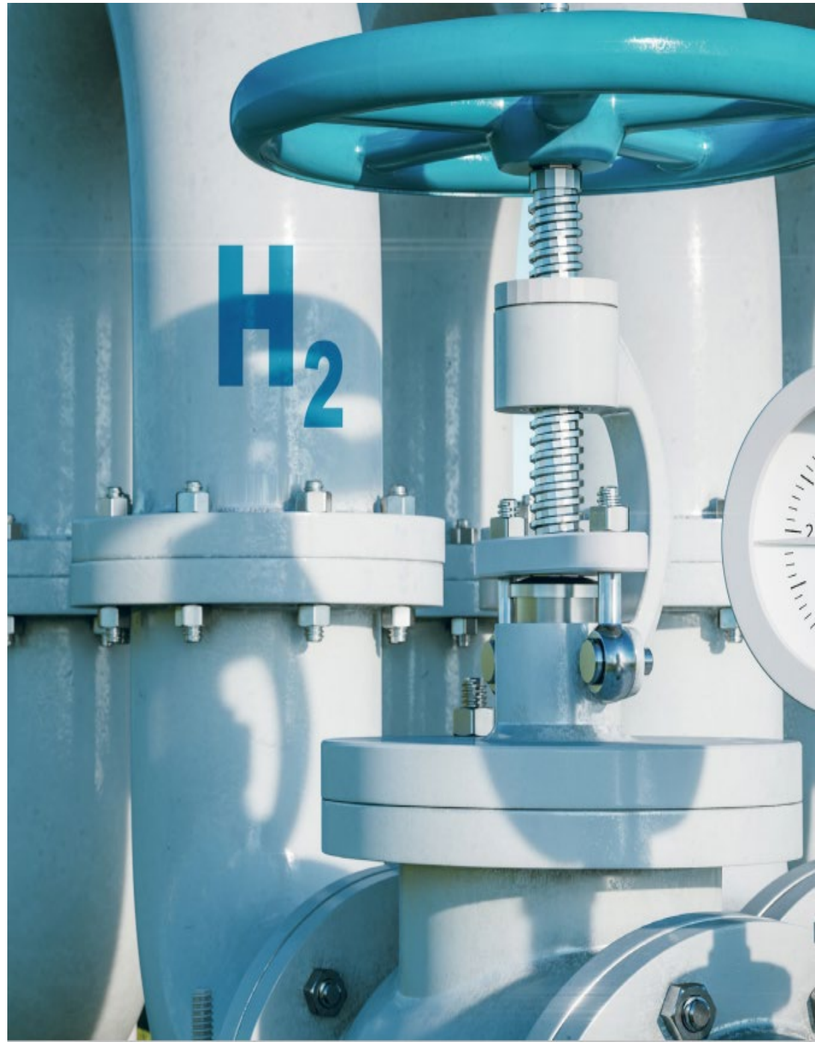
- **Unattended facility:** An unattended Class 1 and Class 2 Hydrogen Facility that is operating must have the following minimum monitoring requirements:
  - Full automation of the facility;
  - Automatic warning, alarm, and emergency shut down;
  - Remote process and facility monitoring capability; and
  - Automatic qualified personnel call out.

- **Attended facility:** An attended Class 1 or Class 2 Hydrogen Facility must have the following minimum monitoring requirements:
  - Continuously monitored by qualified personnel;
  - Semi or full automation of the facility; and
  - Automatic warning, alarm, and emergency shut down.

Pre- Operational Requirements – Class 1 and 2

Intent: Require testing that is reasonably necessary to ensure the facility is safe to operate prior to putting any part of a facility into operation.

- Require inspecting and testing of:
  - Components and systems in accordance with the engineering design and the requirements of the codes and standards;
  - Control and safety critical devices and systems to verify the devices and systems are operating in accordance with the engineering design; and
  - Fire suppression systems, if any.
- Conduct:
  - Leak tests of equipment and piping systems ; and
  - Any other inspections or tests reasonably necessary to ensure the facility is safe to operate.
- Submit a Statement from Engineer of Record in the form and manner the Regulator requires confirming:
  - The hydrogen facility has been designed, constructed, inspected, and tested in compliance with all applicable regulations, codes, and standards;
  - All pre-operation inspection and testing of the hydrogen facility has been completed; and
  - All facility equipment has been inspected and reviewed by qualified personnel to verify that it is safe for operation.



Notification Requirements

Intent: The BCER strives to ensure communications between the Regulator, the permit holder, First Nations, land owners occur throughout the entire life cycle of an activity.

Notification requirements for Class 1 and Class 2 Facilities:

- At least two days before beginning construction of the hydrogen facility.
- At least 14 days before operation of any part of the hydrogen facility.
- At least 24 hours before putting new or modified equipment into service.
- At least 24 hours before beginning a planned shutdown of the hydrogen facility or part of the hydrogen facility.
- Within 24 hours of an unplanned shutdown of the hydrogen facility or part of the hydrogen facility.
- At least five days before operations resume after a suspension of the facility.
- At least 60 days before beginning the decommissioning process and on completing the decommissioning process.
- When an emergency occurs notify the Regulator within one hour of becoming aware of the incident.
- Notify the Regulator within 24 hours of becoming aware of an incident.

Environmental Requirements – Class 1 and 2

Intent: Minimize duplication of environmental requirements by leveraging provincial and municipal frameworks for environmental protection while establishing outcome -based requirements that allow permit holder flexibility.

Application Requirements

- If the Qualified Professional deems it necessary given the results of the assessment of environmental effects to implement measures to minimize adverse effects, ensure these are implemented by the permit holder.

Nuisance Issues

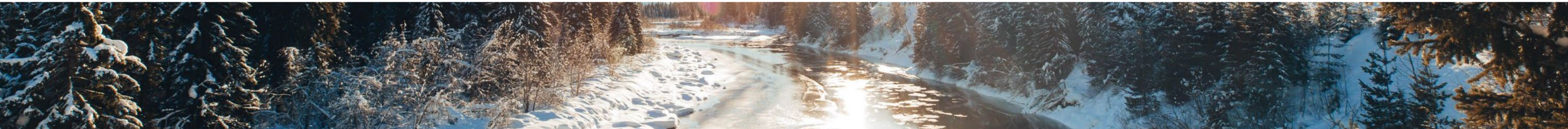
- Limit the impact of excessive noise and light emissions during construction and normal operations.

Fugitive Emissions Management Plan

- Develop, implement and maintain a fugitive emissions management plan that details the processes and procedures to detect, control and respond to emissions of gases or vapours from pressurized equipment due to leaks and other unintended or irregular release of gases.

Flaring and Venting

- Prohibit venting of gas from a hydrogen facility unless the gas heating value, volume or flow rate is insufficient to support stable combustion.
- Minimize quantity and duration of venting and flaring, if included in design.
- If venting or flaring occurs, ensure the emissions from vents or flares do not cause:
  - A material threat to life or health,
  - Off-site odours, or
  - Injury to vegetation or wildlife.
- Ensure ignitable vent stacks and flares are sited so the thermal radiation flux at the locations is within certain limits.



Security Management – Class 1 and 2

Intent: The approach for security management is to enable flexibility and scale regulatory requirements according to the security threats. It is anticipated in municipal settings, applicable requirements for security set out in the B.C. Fire Code will be a familiar point of reference to local authorities.

Security Management requirements for Class 1 and Class 2 Facilities:

- Assess physical and cyber security, and
- Identify and implement preventive security measures to deter unauthorized operation of, or restrict access to, process equipment where access must be restricted to authorized personnel.

Emergency Management – Class 1 and 2

Intent: The main interest in emergency management for Class 1 and 2 is ensuring project proponents and permit holders consult and share information on risks and understand the response capabilities of local authorities responsible for emergency response.

For consistency across the emergency management framework some specific considerations are identified where a proposed project is located within a municipality, and where coordination between a permit holder and the local authority is essential for public safety.

Class 1	Class 2 – In addition to Class 1 Requirements

• Prepare and maintain:
  - An emergency response plan
  - A training program plan
 	
• Ensure employees and other persons working on behalf of the permit holder who have a role in an emergency response have appropriate training prior to assigning emergency response roles.
 	
• Establish and maintain a liaison with the local authority for emergency response activity at its facility and consult with them in developing and updating any emergency response plans.
	• An emergency response plan must include:
	  - Emergency response procedures and guidelines, and
	  - Processes for the preservation of evidence.
	• Determine first responders and supporting agencies that could be involved in an emergency and provide those identified with the facility location and a description of hazards.
	• Work with local authorities to establish, coordinate and maintain a process for the safety of response personnel and the public, involved in, and affected by, an emergency.
	• Establish actions to be taken during an emergency.
	• Identify information that must be provided to local authorities and local First Nations
	  - The name and contact information of the permit holder.
	  - A description of the site-specific hazards and risks that is the subject of the plan.

Facility End-of-Life

Intent: Set out transparent requirements for a permit holder to safely suspend a facility and remove a facility at the end of life.

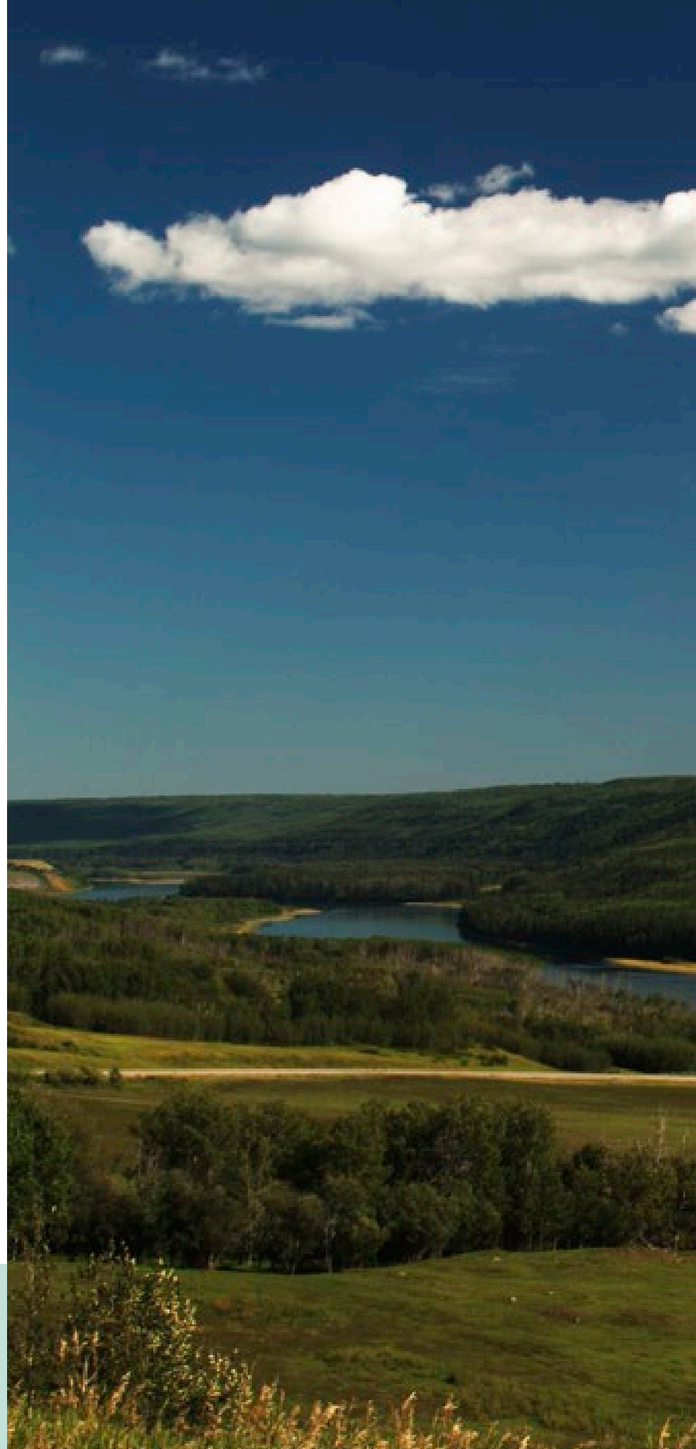
Suspension of a facility:

- In the event of a suspension of the facility, require a permit holder of a class 1 or 2 hydrogen facility to:
  - Implement a suspension plan prepared by a Qualified Professional, and
  - Give the Regulator a copy of the suspension plan.

Decommissioning of a facility:

- Prescribe the removal of the Class 1 and Class 2 Hydrogen Facility:
  - Require removal from the site any facilities and other equipment associated with an energy resource activity that is permitted by the permit.
  - Ensure the decommissioning of a hydrogen facility or part of a hydrogen facility is carried out in accordance with a decommissioning plan prepared by a Qualified Professional.

The Dormancy and Shutdown Regulation is one means to establish requirements and timelines to remediate and restore sites.



Administrative – Quantification

Intent: In anticipation of provincial direction around reporting, establish quantification of inputs and outputs of the hydrogen manufacturing process at a Class 1 and 2 Hydrogen Facility.

- Quantify amount of electricity used for production, and amount and composition of feedstock, products and waste used or generated at a hydrogen facility.

- Ensure the methods used to determine quantities and composition are suitable for those purposes.

- Ensure where measurement equipment is used, it is:
  - Suitable for its purpose,
  - Calibrated properly and maintained in good operating condition, and
  - Safe from adverse weather and interference by unauthorized persons.

Administrative

Exemption:

- Enable the use of an exemption provision that would allow the BCER to make decisions in case of unforeseen circumstances.

Records:

- Require a record retention program.
- Prescribe records, reports, plans that must be maintained, such as:
  - Flared and vented materials (quantity and composition), if flaring included in design.
  - Construction, post-construction and maintenance records demonstrating compliance with engineering design and integrity management program.
  - Date of survey, method used, results, and corrective action plan (if any) associated with the fugitive emissions management program.
  - Pre -operation testing.
  - Information used to quantify the electricity used for production, feedstock, products and waste used or generated at a hydrogen facility.
  - Any spillage, and any damage or malfunction likely to cause spillage that could be a risk to public safety or the environment.
  - Associated with the implementation of the suspension plan and decommissioning plan.

Engagement – How to Provide Feedback

How to Get Involved

- This presentation will be shared with industry and others who have provided input so far with a request for comment or opportunity to meet for focused discussions.

- If you have any additional feedback not addressed in today's session that will inform the enhancement of the regulatory framework, please include it in your written submission.

Next Steps

- Implementation – development of Guidance Materials

Future Work

- Additional topics for review include:
  - Financial Assurance
  - Liability Management
  - Remediation and Reclamation Obligations
  - Cost Recovery

Please provide your written submissions by December 19th, 2024 to: regulatoryaffairs@bc-er.ca.


BC ER
BRITISH COLUMBIA ENERGY REGULATOR
bc-er.ca | regulatoryaffairs@bc-er.ca
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