

BUILDING A SAFER  
INDUSTRY TOGETHER

# 2026 WOOD PELLET & BIOMASS SAFETY SUMMIT

June 9-10, 2026 | Prince George, BC



**BC Forest Safety**  
Safety is good business



Media Sponsor



# WPAC Safety Summit

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## SAFETY COMMITTEE PROJECTS: PROGRESS & WHAT'S NEXT

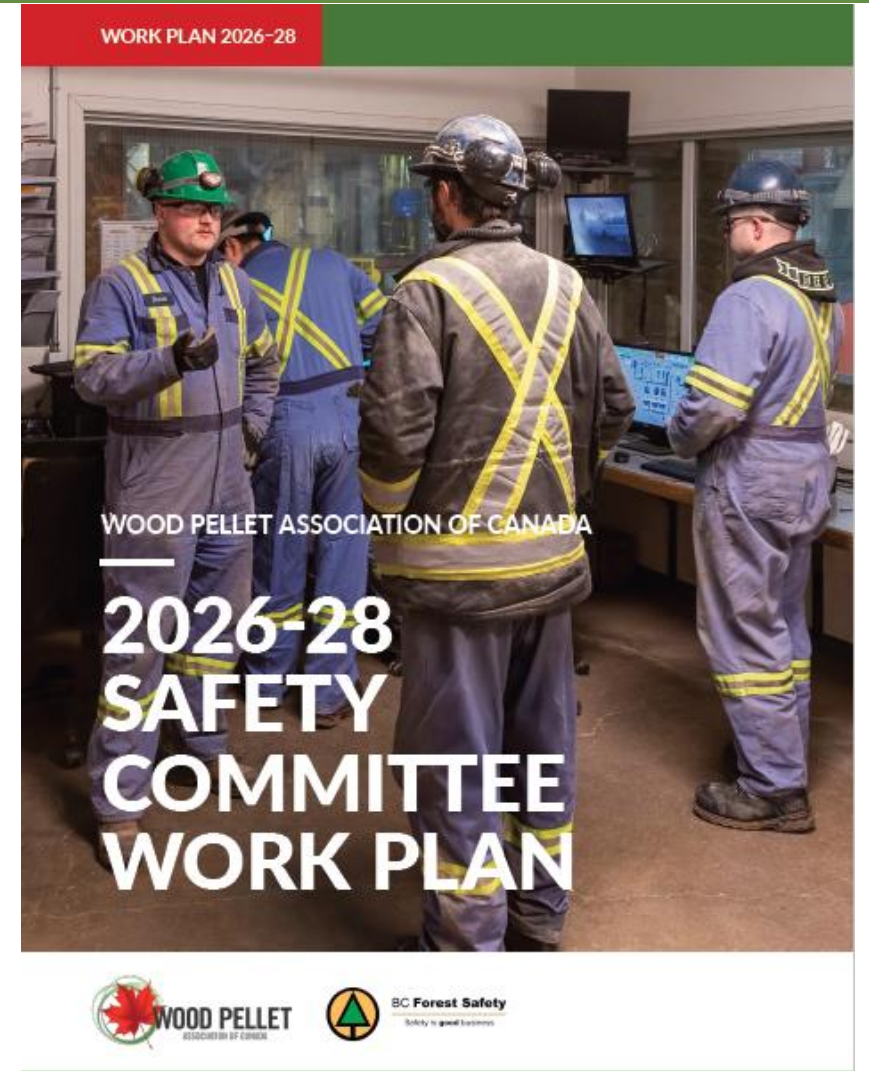


Julie Griffiths  
June 9, 2026

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# WPAC SAFETY COMMITTEE

- Established in 2014.
- Initial focus on combustible dust.
- Expanded to other occupational, health and safety matters, including lockout tagout, working at heights, confined spaces and process safety.
- Continuously progressive safety projects that reflect and respond to the needs of the sector.
- Work closely with WorkSafeBC and BC Forest Safety Council.



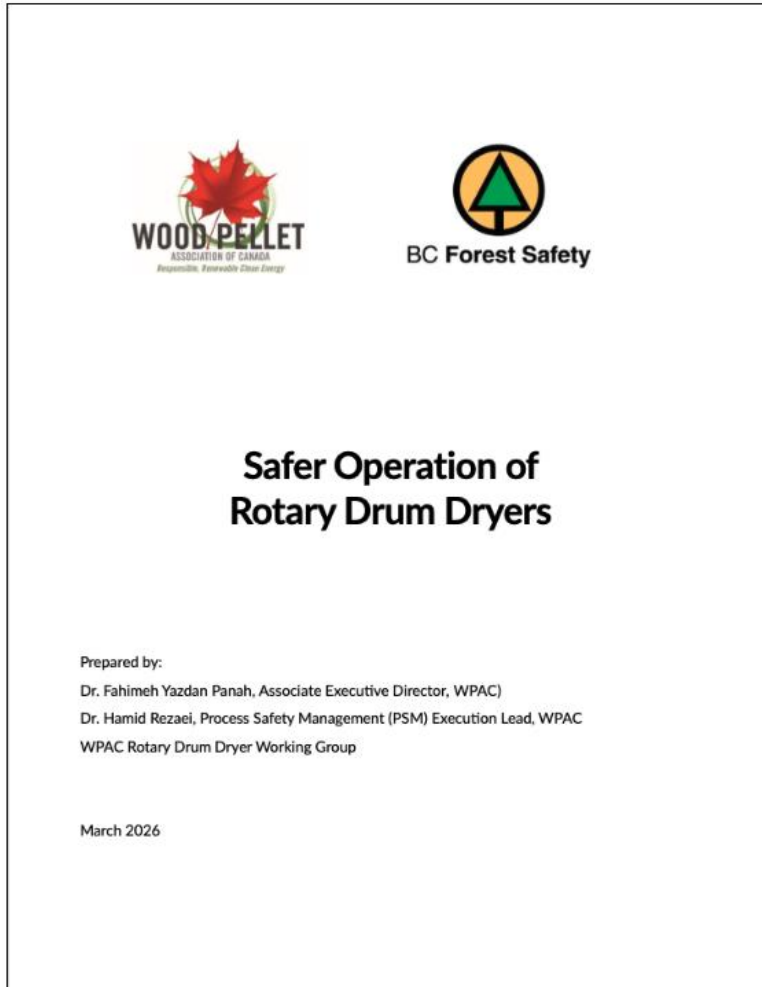
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# WPAC SAFETY COMMITTEE

- Monthly 1-hr meeting
- Members are primarily from wood pellet and biofuel industry, UBC, WPAC, Forest Safety Council
- Meetings include:
  - Safety share
  - Scenario and discussion
  - Opportunity for industry discussions
  - Updates to ongoing projects & info sharing
  - Review of new industry requirements or government initiatives



# ROTARY DRUM DRYER SAFETY



- Report published March 2026: Safe Operations of Rotary Drum Dryer Report
- Developed by a multi-stakeholder working group over the past two years
- Article summarizing the 7 habits that prevent fires before they start
- Upcoming webinar (Q3-Q4)

# SOP – WINTER TRUCK LOADING/UNLOADING

- SOP published March 2026
- For truck drivers, operators, supervisors, maintenance, EHS and contractor
- Includes templates for use in facility
  - Driver quick-reference
  - Rescue plan/shift
  - Step-by-step tipper unloading
- Upcoming 15 min huddle and article (Q3)



## Standard Operating Procedure (SOP) for Winter Truck Loading/Unloading

Prepared by:  
Dr. Fahimeh Yazdan Panah, Associate Executive Director, WPAC  
Dr. Hamid Rezaei, Process Safety Management (PSM) Execution Lead, WPAC

Reviewed by:  
Trevor Murdock, HS&E Coordinator, BioNorth Energy

March 2026

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# ONGOING AND UPCOMING SAFETY INITIATIVES

- Process safety management
- Mental health
- Musculoskeletal injuries (MSI)
- Safe wood pellet handling and storage webinar
- Semi-annual meetings with WorkSafeBC
- Safety Hero
- Communications



# PELLET.ORG/SAFETY



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# SAFETY INITIATIVES

## TRAINING

- Wood Pellet and Bioenergy Safety Summit (+)
- Online Learning Platform: [wpaclearning.com](http://wpaclearning.com) (+)
- Safety Foundation Webinar Series (+)

## LATEST SAFETY INITIATIVES

- Process Safety Management (PSM) (+)
- Rotary Drum Dryer Safety (+)
- Winter Fibre Loading and Unloading (+)

## COMPLETED SAFETY INITIATIVES

- Belt Dryer Safety (+)
- Bow-Tie Analysis of Working at Heights (+)
- Combustible Dust (+)
- Combustible Gas (+)
- Confined Space (+)
- Critical Control Management (+)
- Deflagration Isolation (+)
- Fibre Pile Management (+)
- Inherently Safer Design (ISD) (+)

## DIVE DEEPER

### EVENT

2026 Wood Pellet and Bioenergy Safety Summit

### EXTERNAL LINK

[wpaclearning.com](http://wpaclearning.com)

### FACT SHEET

Online Interactive Operator Safety Training

### REPORT

SOP for Winter Truck Loading/Unloading

### REPORT

Safer Operation of Rotary Drum Dryer

### PAGE

Process Safety Management (PSM)

### NEWS

Power of Pellets: Innovating Our Way to a Safer Better Product

# WPAC SAFETY COMMITTEE

Are you a member of the WPAC Safety Committee or want to become one? You'll find everything you need on this page.

WPAC Safety Committee Responsibilities



Safety Workplans



WPAC Safety Committee Members & Meetings



## DIVE DEEPER

### REPORT

WPAC Safety Committee  
Workplan

### EXTERNAL LINK

Safety Committee Members

### EXTERNAL LINK

Safety Committee Meeting  
Minutes

### EXTERNAL LINK

Past Workplans

### NEWS

Ardent Advocate: Q&A with  
New WPAC Safety  
Committee Chair Julie  
Griffiths

[pellet.org/safety](https://pellet.org/safety)

# SAFETY HERO

WPAC's Safety Hero Award is for WPAC members and their coworkers who work tirelessly to ensure leading safety practices are implemented and embraced.

Nominate a Safety Hero!



## WPAC'S SAFETY HERO



Craig Brightman, Second-Class Power Engineer and Supervisor at BioNorth Energy consistently shows exceptional safety leadership.

Known for going above and beyond in every aspect of his work, Craig leads effective safety meetings, ensuring his team knows not just the "what" but the "why behind safety work practices.

[Learn more about Craig.](#)



Michael Fantillo, Production Supervisor, Premium Pellet, is dedicated to making the workplace safe for himself and his co-workers.

Over the past two years, Michael has successfully led his four-shift team to maintain a recordable incident-free workplace. He hosts every monthly safety meeting, and organizes annual safety drills, reinforcing preparedness and fostering a safety culture.

[Learn more about Michael.](#)

## DIVE DEEPER

### EXTERNAL LINK

[Safety Hero Poster](#)

### NEWS

[Recognizing Safety Excellence: WPAC Names Michael Fantillo of Premium Pellet as a Safety Hero](#)

### NEWS

[Ted Brown, Site Trainer at Drax Entwistle—WPAC's Latest Safety Hero](#)

### NEWS

[WPAC's June Safety Hero: Brett Wickstrom from Drax Meadowbank](#)

### NEWS

[WPAC's May Safety Hero: Brian Flutter, Electrician at Drax High Level](#)

### NEWS

[WPAC's Latest Safety Hero: Brian Penney, Safety Manager at Drax Entwistle](#)

[pellet.org/safety](http://pellet.org/safety)

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# SAFETY RESOURCES

All Resource Types



All Categories



Apply filters



FACT SHEETS



VIDEOS



REPORTS



NEWSLETTERS



WEBINARS/  
PRESENTATIONS



INFOGRAPHICS

[pellet.org/safety](https://pellet.org/safety)

# FREE ONLINE OPERATOR TRAINING PROGRAM

Safety Foundation Webinar Series	Plant Operators Health and Safety Training	Professional Skills for Supervisors
<ul style="list-style-type: none"><li>• Human-Machine Interaction (HMI)</li><li>• Safe Handling &amp; Storage of Biomass</li><li>• Bow Tie Analysis</li></ul>	<ul style="list-style-type: none"><li>• Workplace Attributes</li><li>• Risk &amp; Risk Control</li><li>• Legislation, Regulations &amp; Tickets</li><li>• Health and Safety of Operators</li><li>• Upset Conditions</li><li>• Process Safety Management</li><li>• Combustible Dust &amp; Gas</li><li>• Plant Operations</li></ul>	<ul style="list-style-type: none"><li>• Human Factors</li><li>• Orientation, Training &amp; Skills Development</li><li>• Effective Safety Supervision</li><li>• Communication Skills</li><li>• Leadership Skills</li><li>• Due Diligence</li><li>• Hazard ID, Inspection &amp; Investigation</li></ul>

wpaclearning.com



# FREE ONLINE SAFETY TRAINING



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- Human-Machine Interaction (HMI)
- Safe Handling & Storage of Biomass
- Bow Tie Analysis

## Plant Operators Health and Safety Training

- Workplace Attributes
- Risk & Risk Control
- Legislation, Regulations & Tickets
- Health and Safety or Operators
- Upset Conditions
- Process Safety Management
- Combustible Dust & Gas
- Plant Operations

## Professional Skills for Supervisors

- Human Factors
- Orientation, Training & Skills Development
- Effective Safety Supervision
- Communication Skills
- Leadership Skills
- Due Diligence
- Hazard ID, Inspection & Investigation



Receive a certificate after completing testing on each topic. Visit [wpaclearning.com](http://wpaclearning.com) today.

DEVELOPED BY



BC Forest Safety  
Safety is good business

This project was partially funded through a WorkSafeBC small initiatives grant. The views, findings, opinions, and conclusions expressed herein do not represent the views of WorkSafeBC.

**WHAT'S ARE THE BEST WAYS TO  
GET THE WORD OUT ABOUT  
WPAC SAFETY RESOURCES?**

# WHAT ARE THE BEST WAY TO GET THE WORD OUT ABOUT WPAC SAFETY RESOURCES?

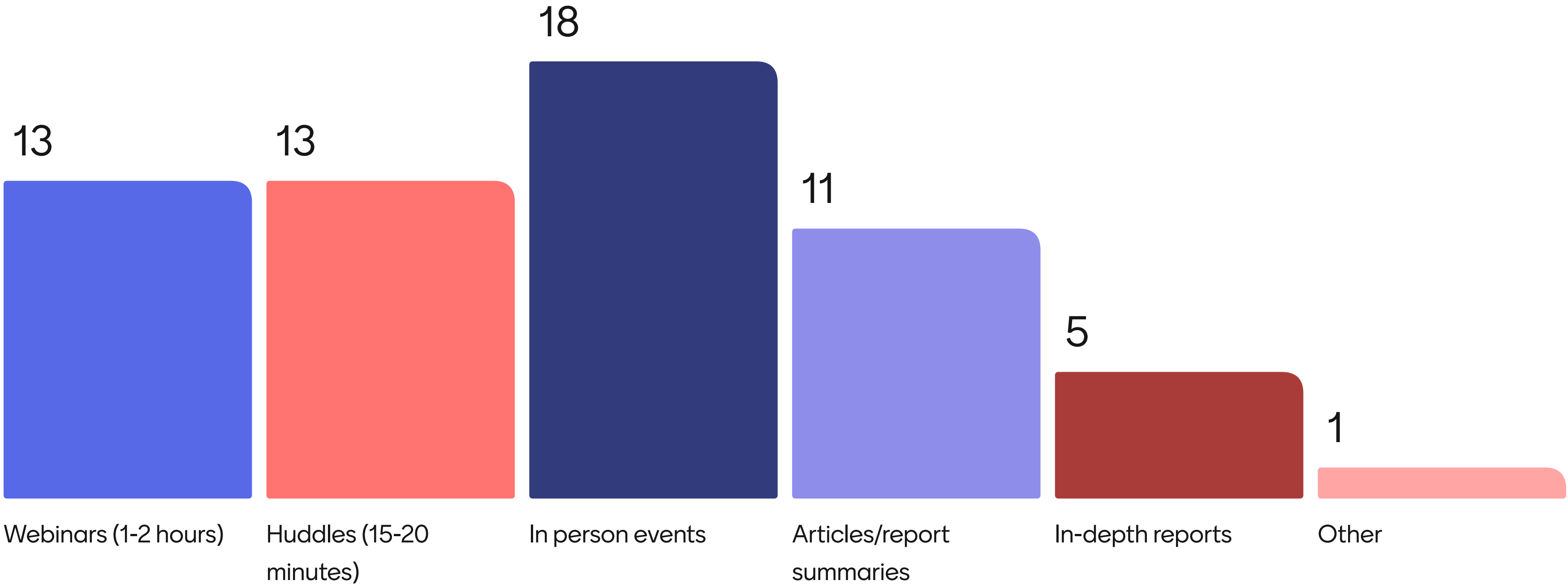
- Word of mouth (7)
- Social media (6)
- Emails (6)
- Website (5)
- Crew talks (3)
- QR codes (3)
- Networking (2)
- Toolbox talks (2)
- Pop-up displays (1)
- Face to face (1)
- Open discussion (1)
- LinkedIn push emails (1)
- WPAC newsletter (1)
- Radio ads (1)
- YouTube shorts (1)
- Tradeshows (1)
- Safety Summits (1)
- Brochures (1)
- All of these above (1)

\* Number of responses in brackets

# WHAT IS THE BEST WAY FOR YOU TO LEARN ABOUT SAFETY (SELECT AS MANY AS YOU WANT)?

- Webinars (1-2 hours)
- Huddles (15-20 minutes)
- In-person events (1/2 day to full-day)
- Articles/report summaries
- In-depth reports
- Other

# What is the best way for you to learn about safety?



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# WPAC SAFETY COMMITTEE COMMITMENT

- Safer industry
- Greater cooperation across industry
- Improved reputation with public and regulators



2026 Safety Summit

# SAFE OPERATION OF ROTARY DRUM DRYERS



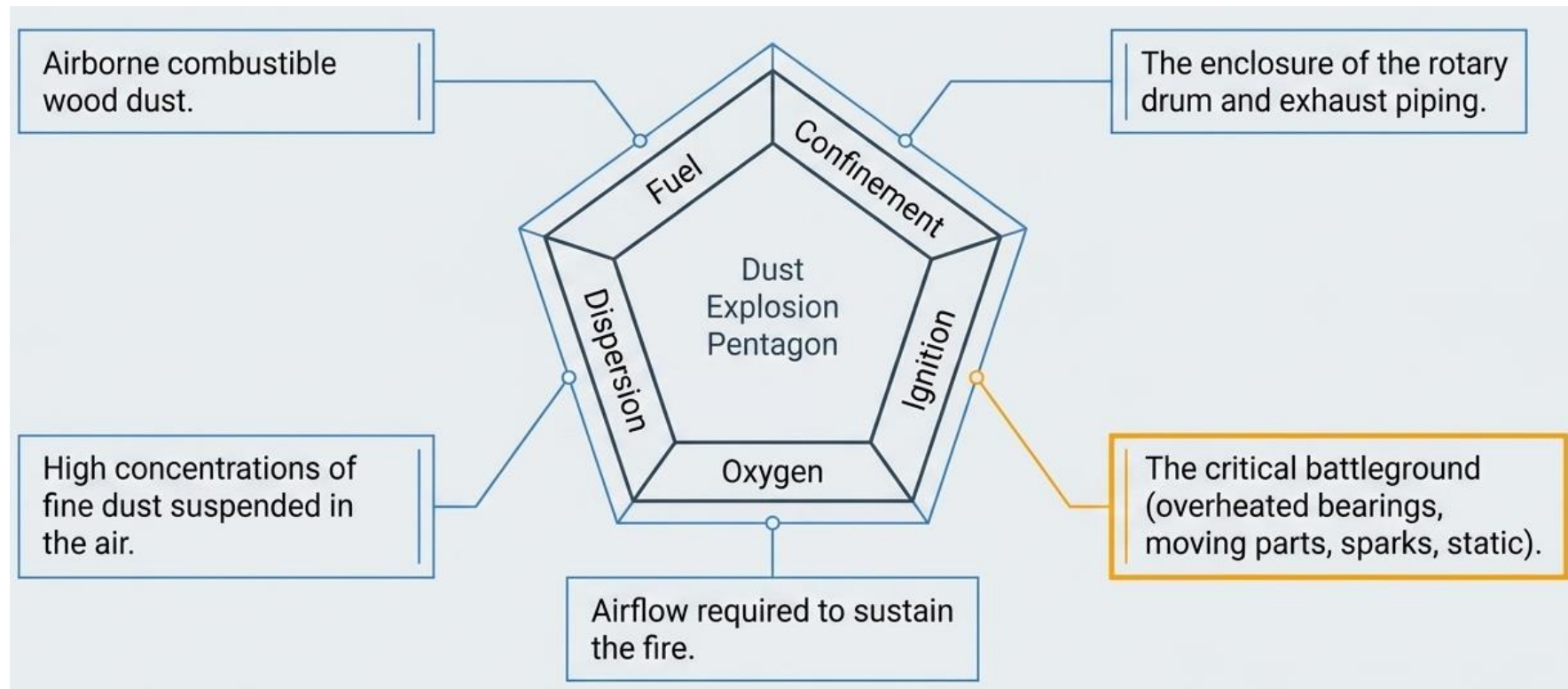
Jeff Johnston (Drax, VP of Operation)  
Hamid Rezaei (WPAC, PSM Execution Lead)  
June 9, 2026

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# AGENDA

- Physics of fires and explosions in rotary drum dryers.
- Takeaways from Rotary Drum Dryer Working Group discussions.
- Common failure modes and near misses.
- Anatomy of safer operations.
- Practical dos and don'ts.

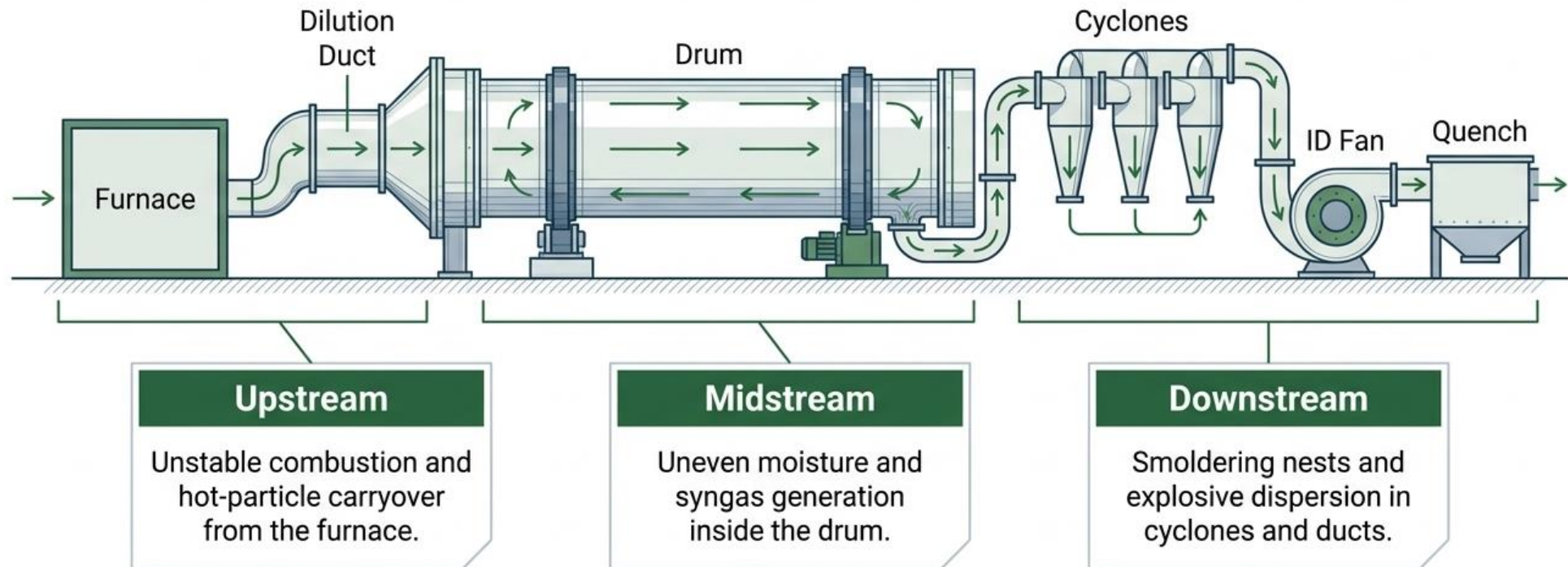
# MECHANICS OF A DRUM DRYER THREAT



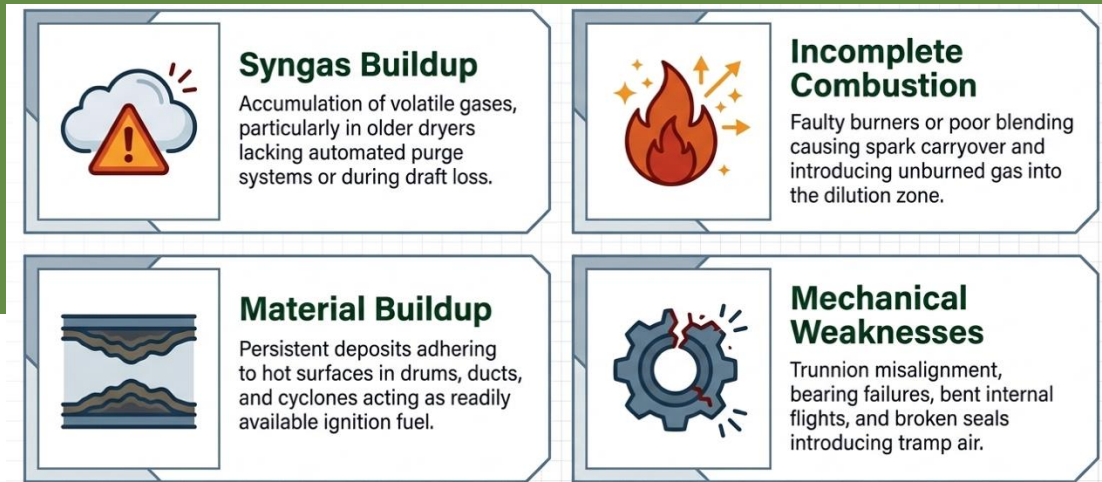
- Drum dryers naturally provide 4 of the 5 elements in dust explosion pentagon.
- Preventing ignition is the primary operational defense.

# DANGER EXTENDS BEYOND THE DRUM

- Managing rotary dryer safety means recognizing the process as a continuous, integrated system.
- The drum concentrates heat, dust, and time, but incidents are rarely isolate to the drum; they propagate through the entire integrated line.



# PREDICTABLE INCIDENTS



## Primary Hazard Drivers

Rotary drum dryer incidents are not inevitable;  
they follow predictable patterns.

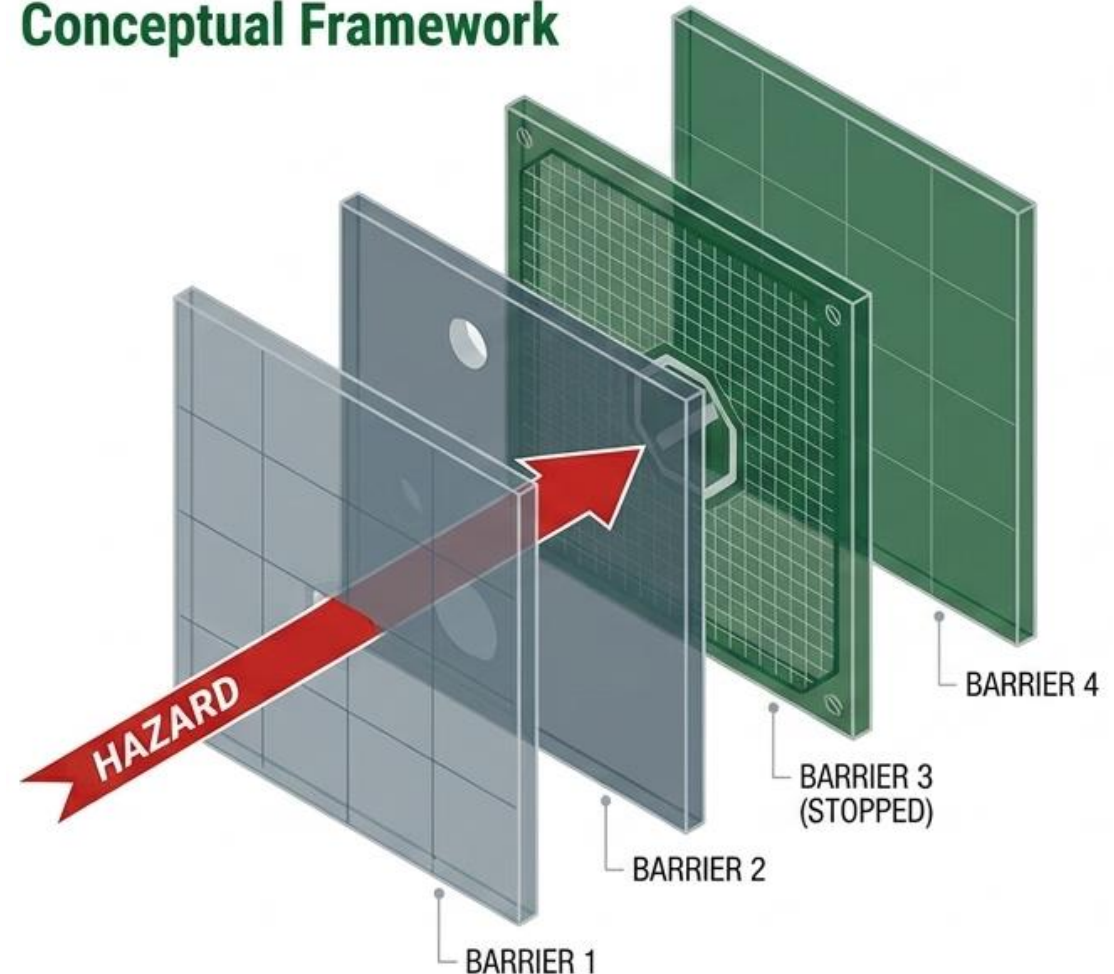
Our opportunity is to strengthen the barriers that matter most and  
build habits that prevent fires before they start.

# SWITCHING FROM “WE CAN” TO “WE PROVE”

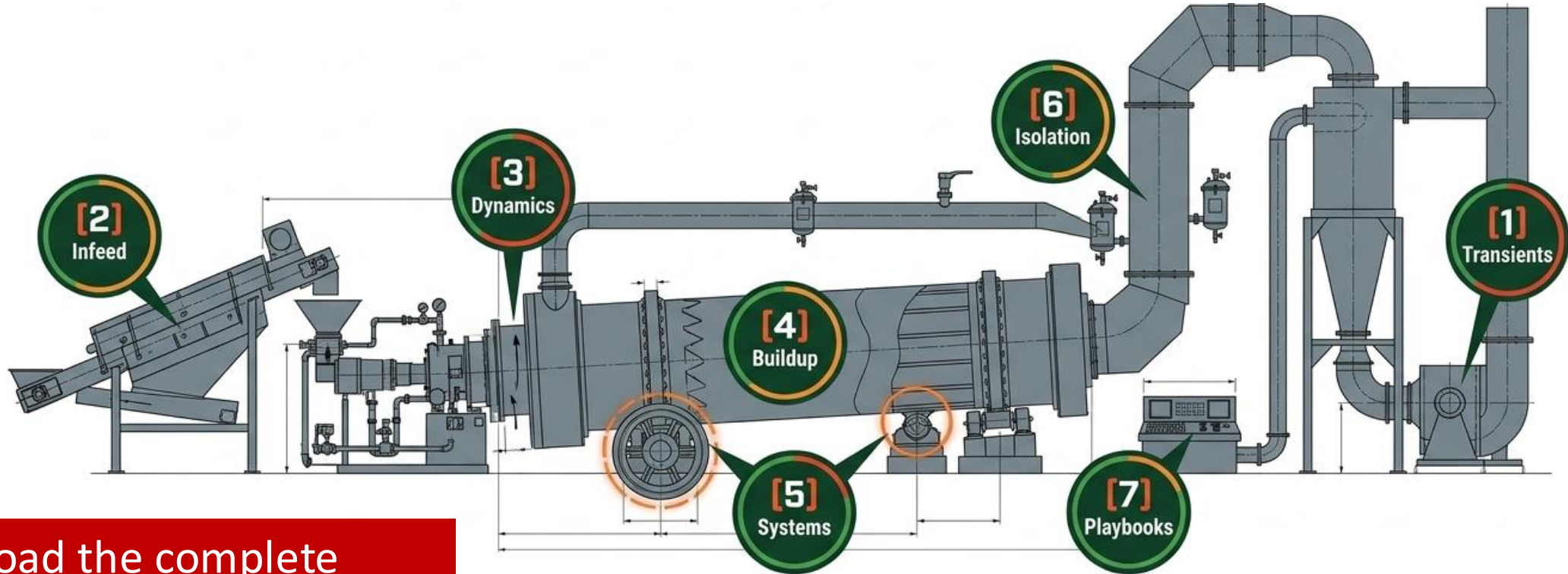
Key outcomes of the WPAC Rotary Drum Dryer Working Group are:

- Shift managing dryer safety as an interconnected system of barriers.
- Replace “**Assumptions**” with “**Proof.**”

## Conceptual Framework



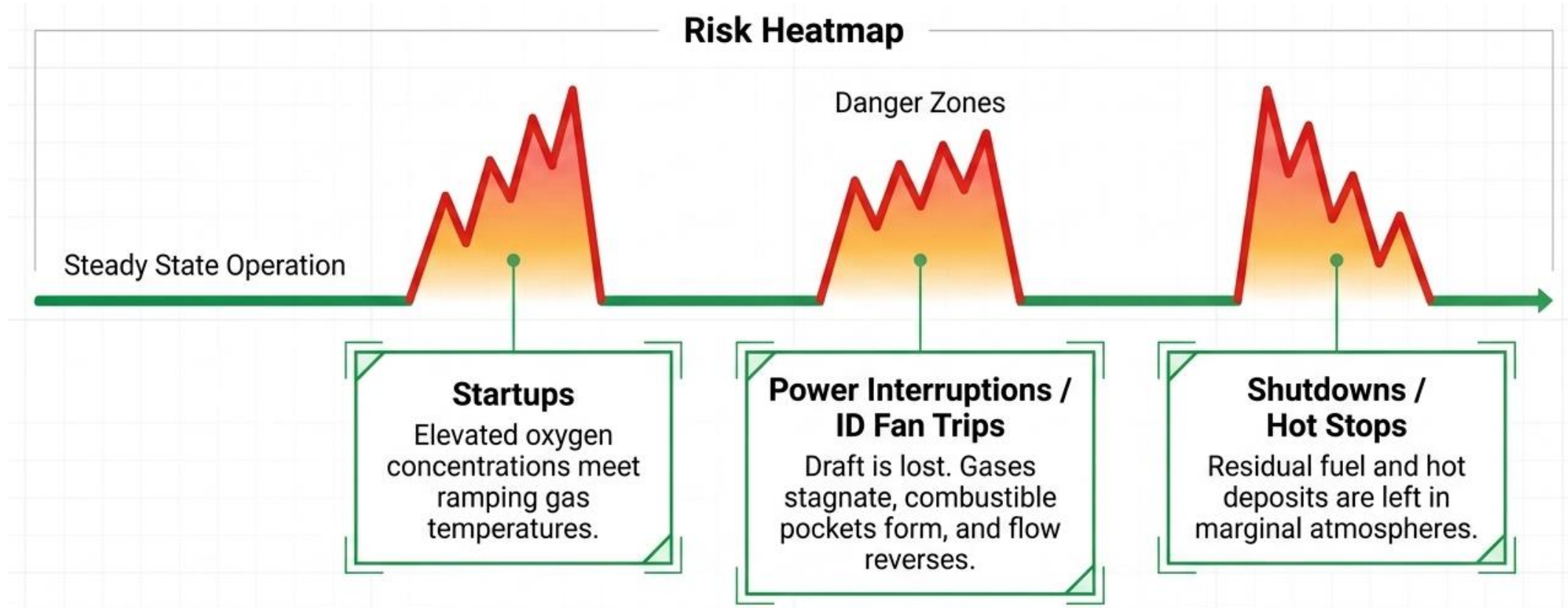
# APPROACH IN WORKING GROUP



Download the complete report at [pellet.org](http://pellet.org)

Dryer safety is achieved when operational habits, physical engineering, and human readiness act as a single, unified barrier against physics.

# HIGHEST RISK DURING TRANSIENT STATES



- Transient phases traverse combustible regimes while equipment state change.
- They must be treated as high-alert “Red-Zone Work” not routine transitions.

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# TREAT TRANSIENTS AS “RED-ZONE WORK”

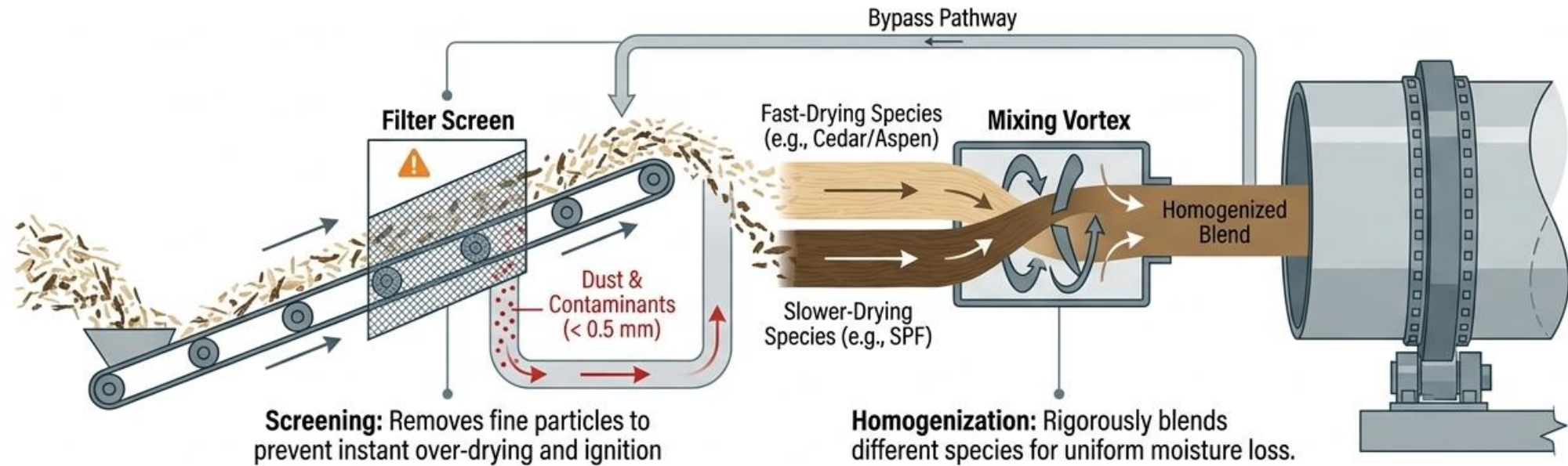
## The Threat

- The highest risk periods are predictable transients. Loss of draft (ID fan trips) or power interruptions cause gases to stagnate, combustible pockets to form and flow to reverse.

## The Barrier

- ✓ Do not treat these events as routine transitions.
- ✓ Recognize them as periods of acute vulnerability requiring hyper-vigilance.
- ✓ Ensure automated safety systems (deluge, isolation) are fully armed.
- ✓ Operators must be strictly focused on purge protocols before re-ignition.

# MANAGE INFEEED FIBER QUALITY



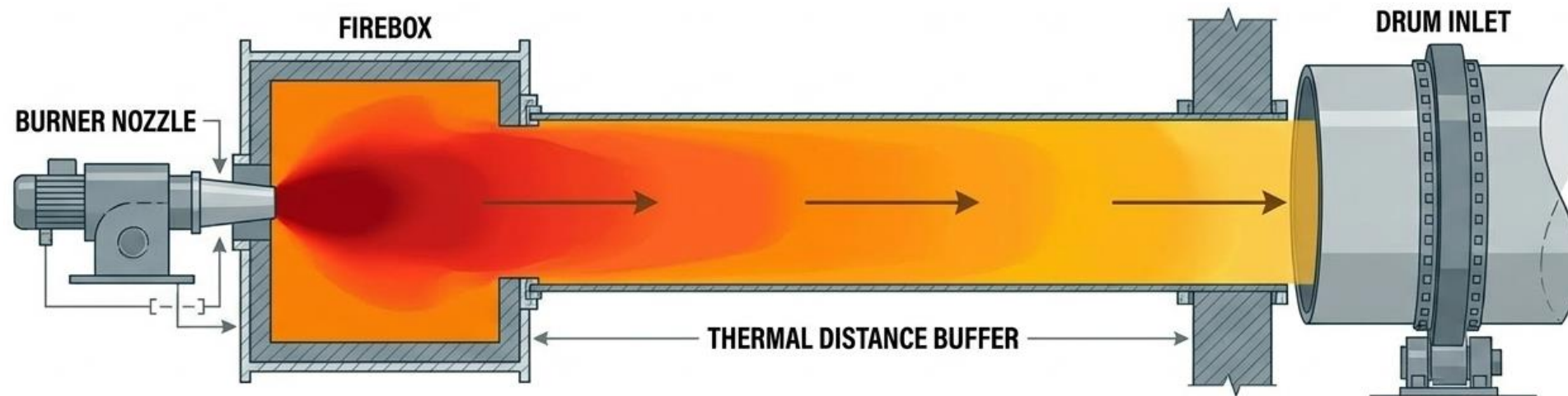
## The Threat

- External feedstock introduces heavy contaminations.
- Poor blending of biomass species adds heterogeneity into the system components.

## The Barrier

- ✓ Screen out extremely small particles (<0.5 mm) to bypass dryer.
- ✓ Adjust furnace manufacturer's recommended moisture content.
- ✓ Rigorously mix feedstock species to ensure uniform drying, eliminating bone-dry pockets.

# ENGINEER SAFE THERMAL DISTANCES



## The Threat

If the burner is too close to the fiber, flame fronts or sparks can easily enter the drum, instantly finding the ideal combustion mix of dry fiber and oxygen.

## The Barrier

- ✓ Lower inlet gas temperatures to widen the safety margin below the biomass burning temperature.
- ✓ Maximize the physical separation between the firebox and the drum.

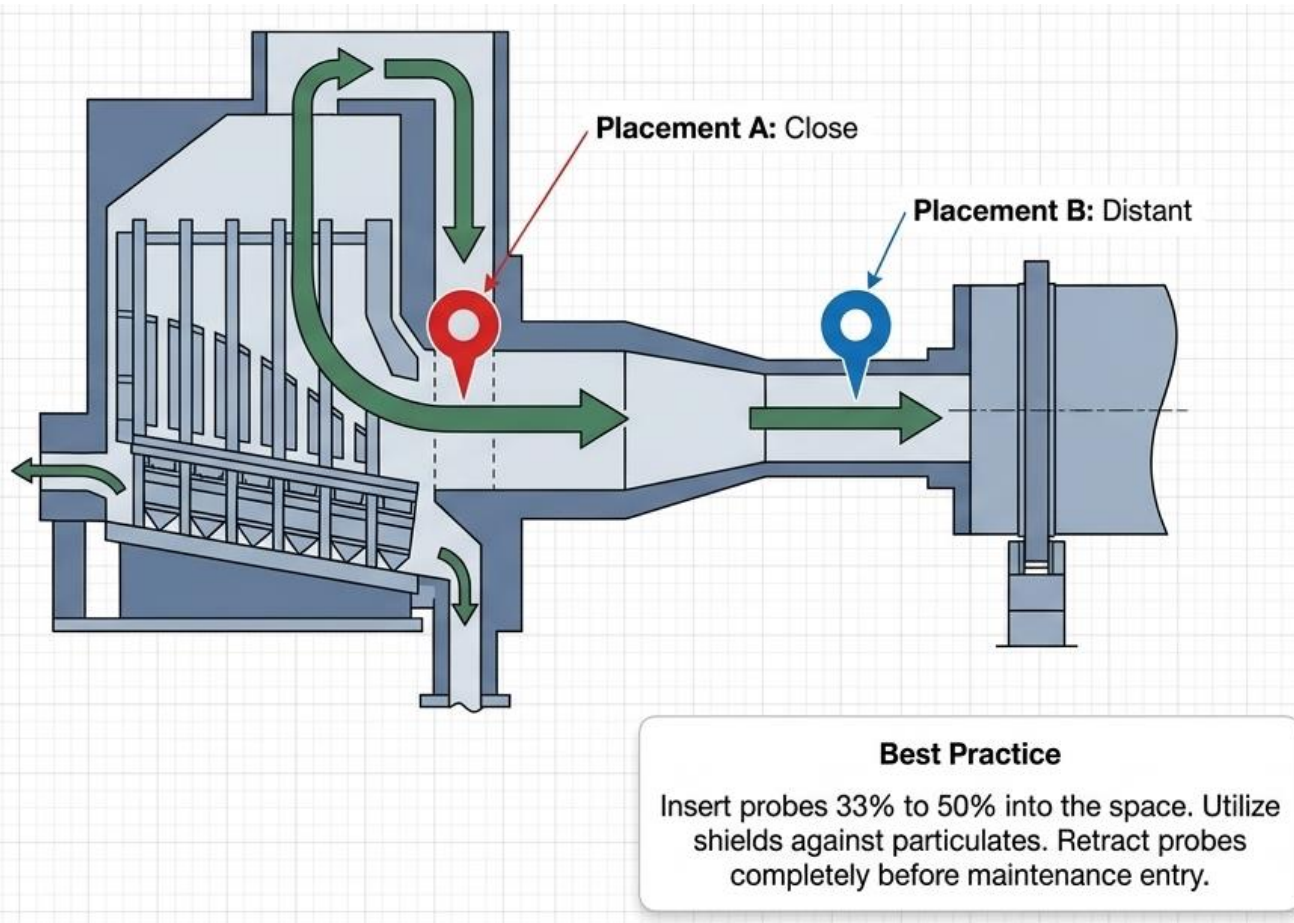
# USE INSTRUMENTS TO WATCH EARLY WARNINGS

	Zirconia (In-situ)	Laser (In-situ)	Extractive (Close-coupled)
Response Time	Up to 90s	Near instant, averaged	~15-30s via Venturi/Convective
Temperature Tolerance	Optimal at 677°C	Max 850°C	Cooled to ~50°C
Capabilities	O2 only	O2, CO, CH4, H2O, Temp	O2, CO, CH4



**Insight: In-situ body placement does not guarantee fast readings. Diffusion filters can significantly delay response times during a critical upset.**

# MEASUREMENT INSTRUMENTATION (CONT.)



## Placement A: Close to Primary Furnace

**Pros:** Faster reaction to primary furnace conditions.

**Cons:** Higher temperature, extreme turbulence, and high risk of clinker forming in the probe.

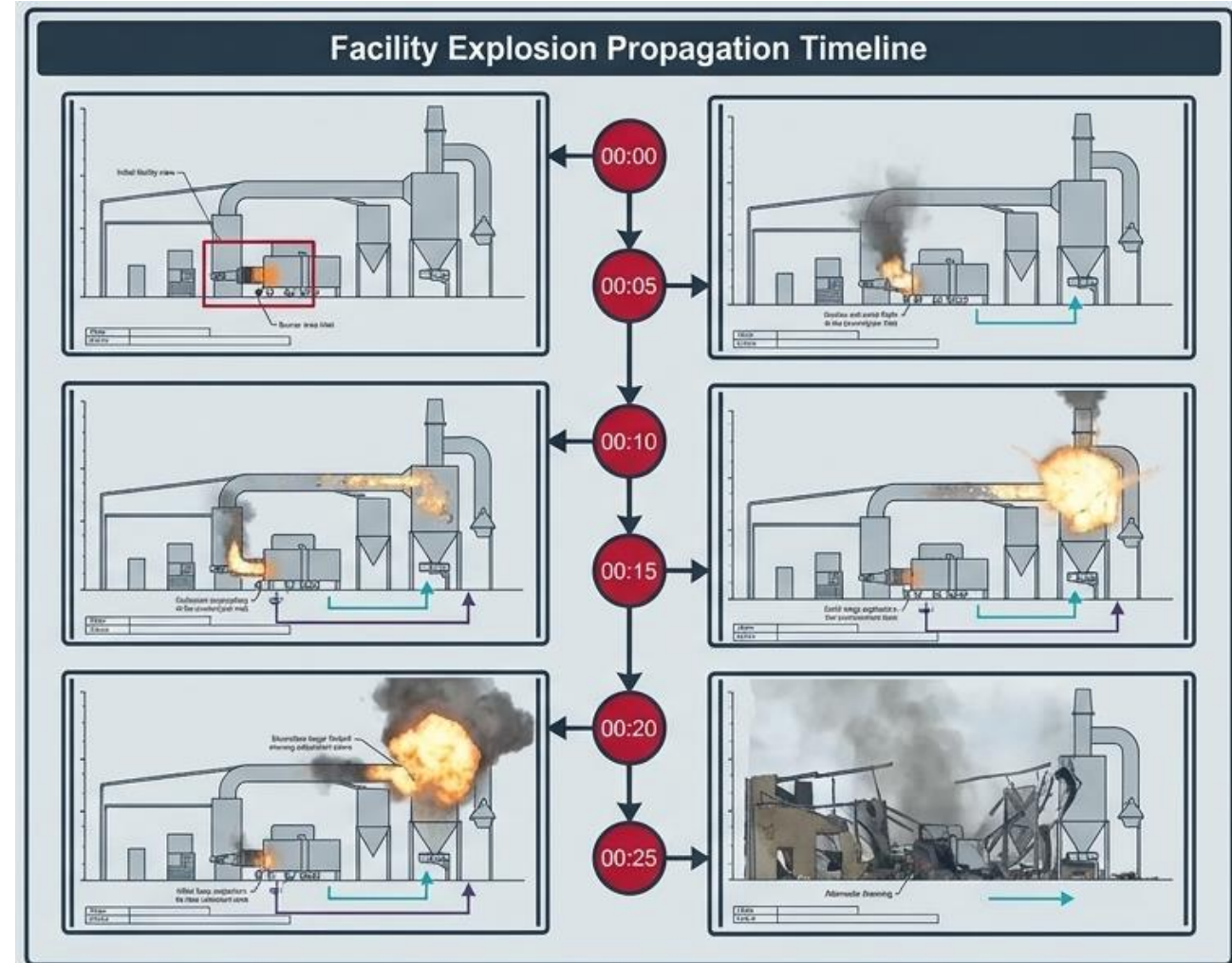
## Placement B: Distant from Primary Furnace

**Pros:** Better average representation of gas conditions, lower clinker risk.

**Cons:** Slower response time to change.

# EXPLOSION ISOLATION

- Even with strong prevention, the report also recognizes a practical truth: the potential for an internal event cannot be eliminated completely.
- The components of the drying system are interconnected, and their connection should be blocked.



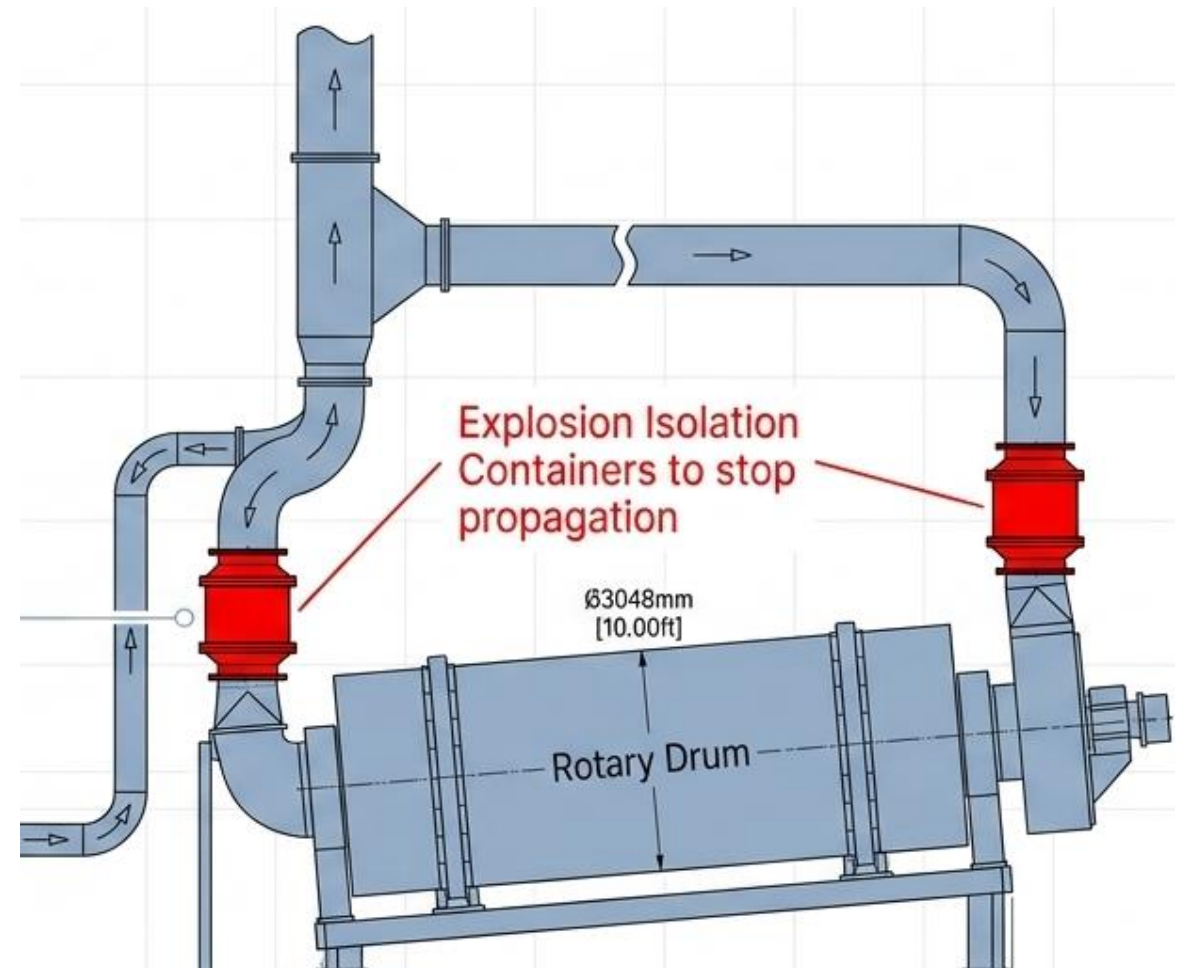
# EXPLOSION ISOLATION (CONT.)

## The Solution

Mitigate the effects by halting propagation. Explosion Isolation Containers are positioned precisely at the exit duct transitions.

## Verification

Isolation barriers must be routinely inspected and verified to ensure containment integrity.



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# ELEVATE HUMAN ELEMENT

**Human factors:** distraction, misinterpretation of alarms, incomplete purges, and delayed reactions.



**Practice 1) Rationalize alarms:** calibrate set-points to prevent “alarm flooding” and operator desensitization.

**Practice 2) Prioritize Criticals:** Elevate ID Fan status, purge flows, and O<sub>2</sub>/CO levels above standard warnings.

**Practice 3) Management of Change (MOC):** Enforce detailed shift handovers recording fiber mixes, equipment deviations, and control logic overrides.

# Quiz Time

Please pull your phones out and go to the website [www.menti.com](http://www.menti.com).  
The code is 48 20 66 98.

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# QUESTION 1

Why does biomass feedstock with a moisture content exceeding 55% represent a primary safety hazard rather than just a production efficiency issue?

- A. It causes overfiring and significant thermal stress on the furnace refractory.
- B. It results in explosive combustion surges due to rapid moisture evaporation.
- C. It induces flame instability and creates pockets of unburned syngas.
- D. It promotes the formation of slag that narrows the burner throat passages.

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## QUESTION 2

Reviewing the Risk Heatmap for operational phases, why are Induced-Draft (ID) fan trips classified as 'Red-Zone Work' with a risk profile comparable to system startups?

- A. Shutdowns are safer because the removal of fuel eliminates all ignition sources.
- B. ID fan trips are the primary cause of mechanical misalignment in the trunnions.
- C. The loss of the fan causes an immediate spike in  $NO_x$  and sulfur emissions.
- D. Loss of draft causes gases to stagnate and creates volatile syngas pockets.

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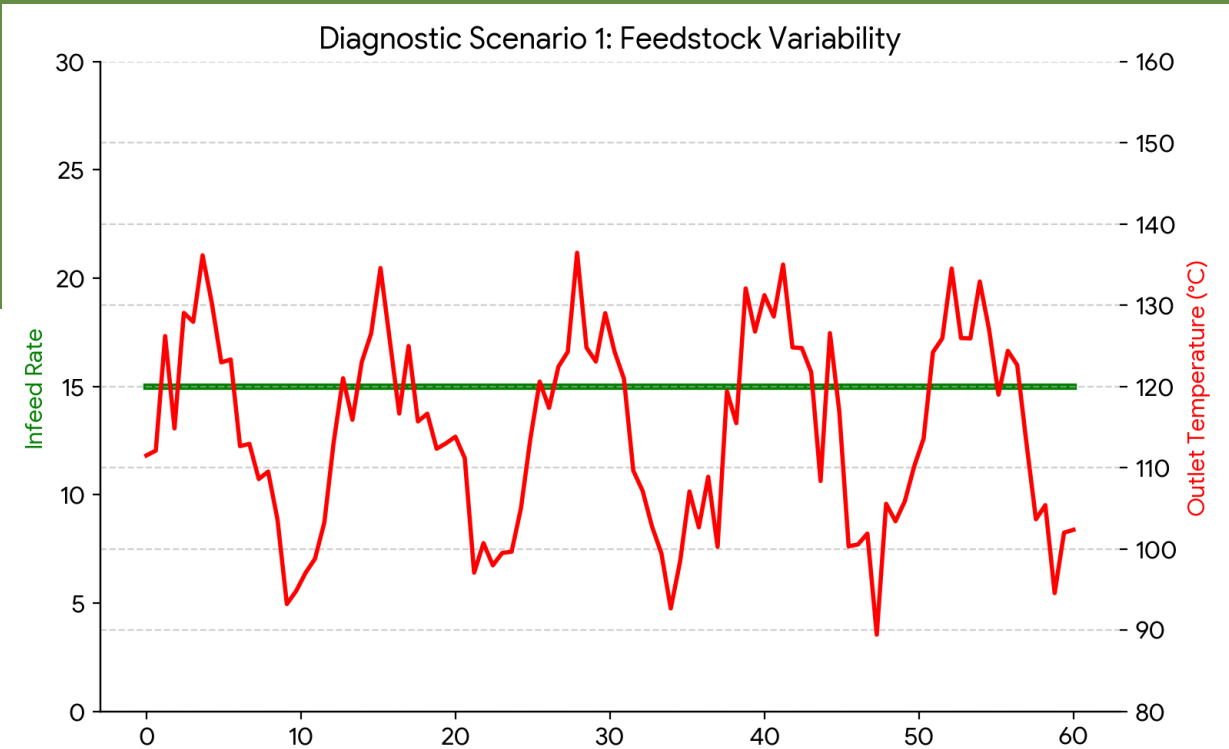
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# QUESTION 3

**Technical Challenge:** The plant is operating at a constant feedstock infeed rate and the heat generation system is steady. However, the HMI displays erratic oscillations in the drum dryer outlet temperature.

What is the primary risk driver associated with this thermal profile of dryer outlet?

- A. A loose thermocouple is generating intermittent electrical signal noise at the drum discharge.
- B. Inconsistent fiber blends and fines variability creating "bone-dry" pockets susceptible to ignition.
- C. Drum rotational velocity is improperly synchronized with the furnace grate speed.
- D. Standard thermal inertia expected during high-throughput steady-state production.

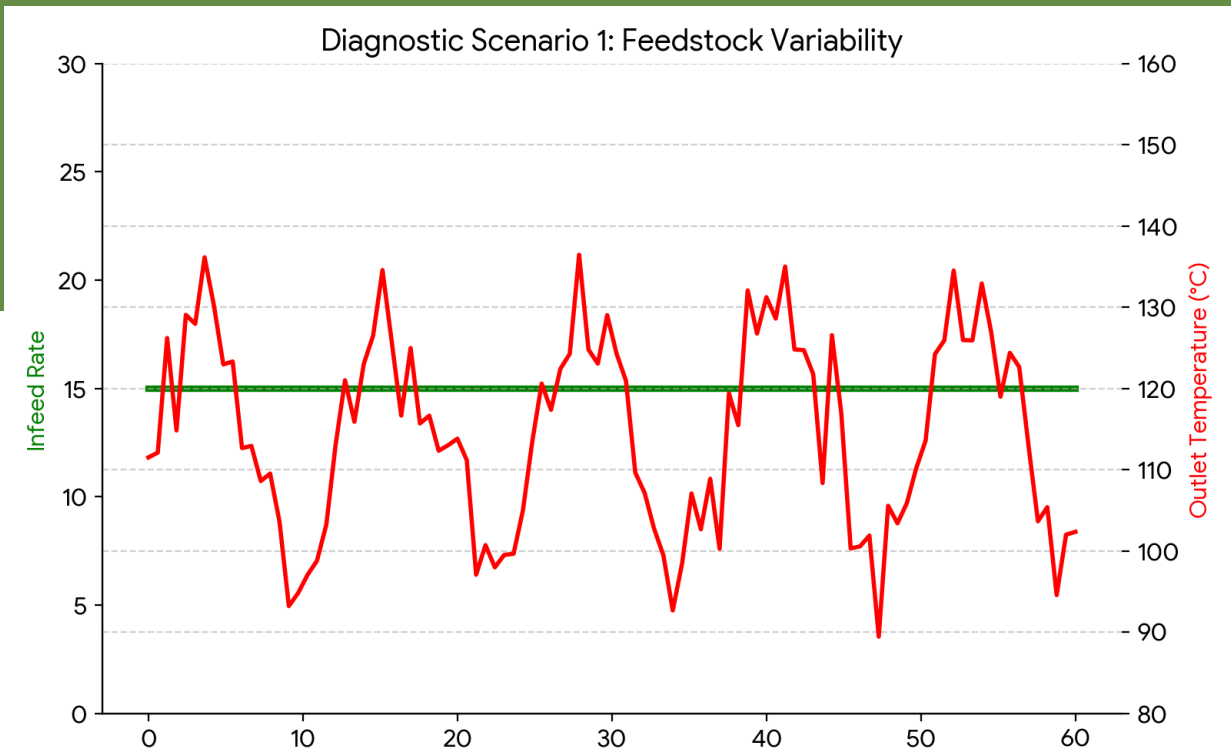


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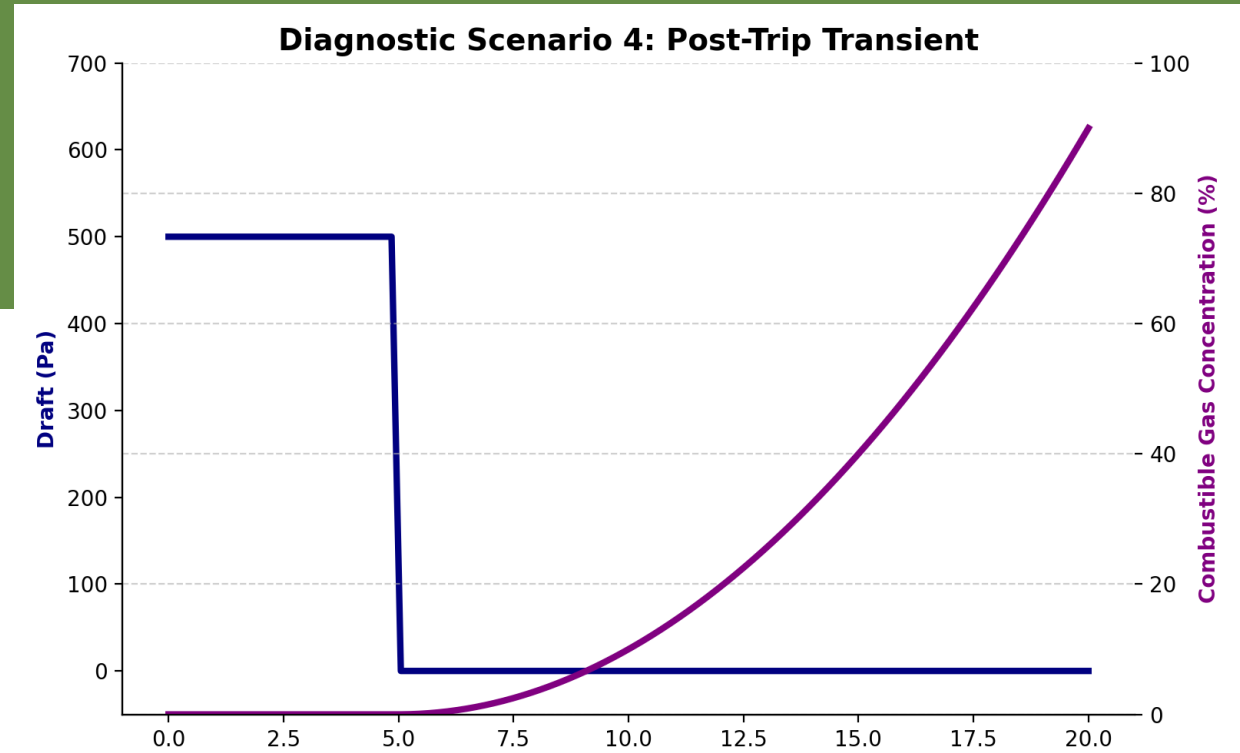
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# QUESTION 4

**Technical Challenge:** The Induced-Draft (ID) fan has tripped, resulting in an immediate loss of system draft and the rapid accumulation of combustible gases (Syngas).

What indicators or safety factors must be verified before the system can be safely restarted?

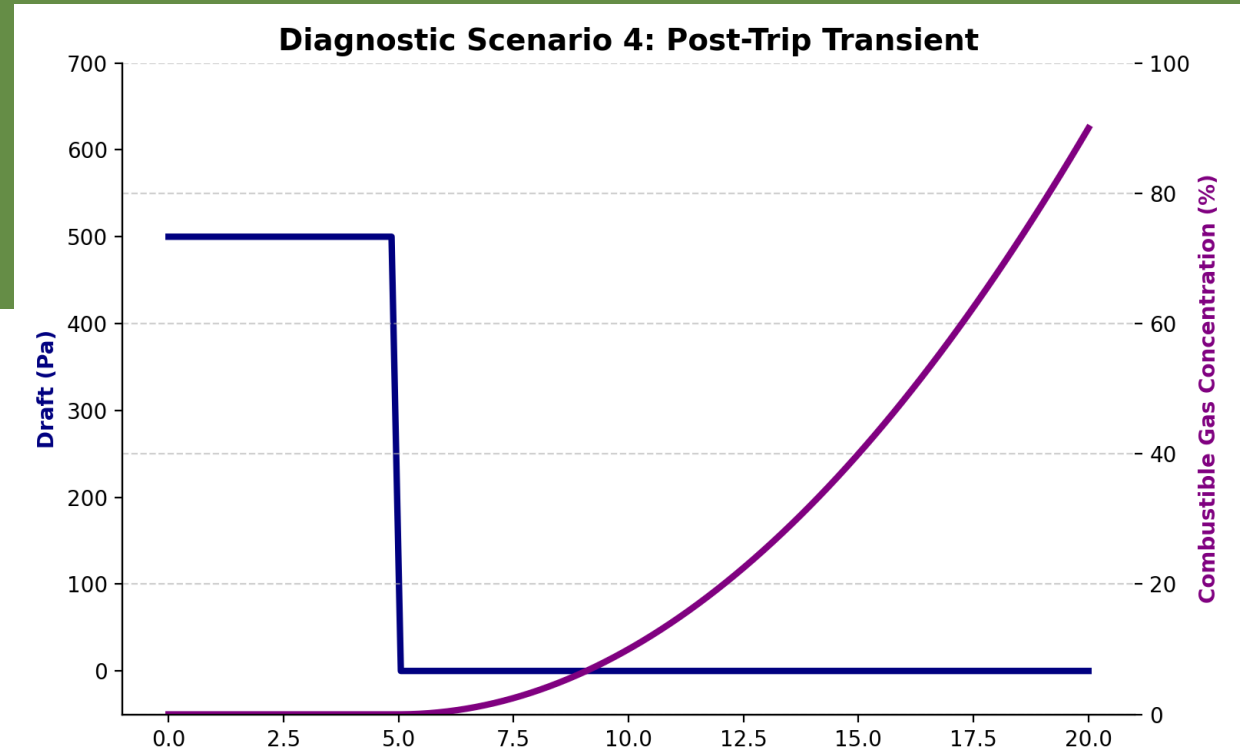


- A. Manual verification of all external explosion relief vent positions and a minimum five-minute furnace refractory "soak" time to stabilize internal heat.
- B. Confirmation of dryer drum motor rotational status and furnace temperature below 450°C.
- C. Completion of a verified purge (confirmed by both time and volumetric flow) and normalization of O<sub>2</sub>, CO, and temperature profiles.
- D. Verification of feed-bin level status and visual confirmation of fire-suppression deluge pump house pressure.

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**Drum dryer incidents are not inevitable; they follow predictable patterns.**

Implement the habits, prove the barriers, and prevent the fires.

Dr. Hamid Rezaei  
[hamid@pellet.org](mailto:hamid@pellet.org)  
Cell: +1 (778) 707-0866



2026 Safety Summit

PSM IMPLEMENTATION:  
2026 WORKPLAN



Fahimeh Yazdan Panah (WPAC, PSM Lead)  
Hamid Rezaei (WPAC, PSM Execution Lead)  
June 9, 2026

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# AGENDA

- Background of Process Safety Management (PSM).
- Adoption in Canadian wood pellet industry.
- Review the 2026 implementation workplan.
- Review real case studies.

# TWO DISTINCT SAFETY DISCIPLINES



## Occupational Safety

- Protects individual workers.
- Prevents high-frequency, low-consequence incidents.
- Target slips, trips, falls, and ergonomic injuries.

**Primary focus:** protects individual worker.



## Process Safety Management (PSM)

- Protects system and facility.
- Prevents low-frequency, high consequence incidents.
- Target fires, explosions, and toxic releases.

**Primary focus:** protects facility, workforce, and community.

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# BENEFITS OF PSM IMPLEMENTATION



## Protect Lives

Eliminates catastrophic hazards, preventing major injuries and environmental damage.



## Ensure Equipment Integrity

Identifies process safety critical equipment to prevent catastrophic failure.



## Improve Business Flexibility

Reduces unplanned downtime and maintenance costs, boosting productivity.



## Product Viability

Secures affordable access to insurance coverage and enhances the sector's reputation.



# THE ORIGIN OF PSM

Industry Origins	Adaptation
<p data-bbox="137 611 830 664"><b>Chemical &amp; Petrochemical</b></p> <ul data-bbox="137 749 1223 1272" style="list-style-type: none"><li data-bbox="137 749 1223 863">• <b>Guiding Standard:</b> OSHA 1910.119 / Seveso Directive.</li><li data-bbox="137 892 1223 1063">• <b>Core Hazards:</b> Complex reactive chemistry, highly hazardous toxic chemicals, massive pressurized releases.</li><li data-bbox="137 1092 1223 1272">• <b>Implementation Approach:</b> Highly prescriptive, complex scale, driven by dedicated process safety specialists.</li></ul>	<p data-bbox="1296 611 1814 664"><b>Biomass Processing</b></p> <ul data-bbox="1296 749 2356 1206" style="list-style-type: none"><li data-bbox="1296 749 2356 863">• <b>Guiding Standard:</b> CSA Z767 (Process Safety Management).</li><li data-bbox="1296 892 2356 1006">• <b>Core Hazards:</b> Combustible wood dust, off-gassing, silo self-heating, deflagrations.</li><li data-bbox="1296 1035 2356 1206">• <b>Implementation Approach:</b> Practical, scalable foundational blocks tailored for operations without dedicated process safety specialists.</li></ul> <p data-bbox="2331 1021 2484 1185"><i>WPAC 2026 focus</i></p>

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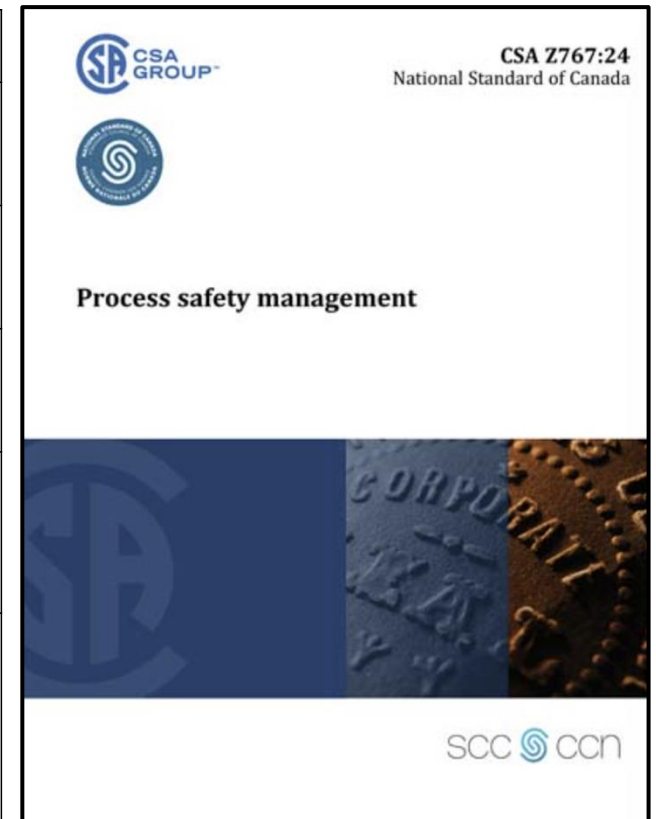
# COMMITMENT STATEMENT

- WorkSafeBC has positioned PSM as a key component in its risk management philosophy and significant investment in this field is being planned.
- WPAC recognizes that PSM is moving forward in Canada through the Canadian Standards Association's CSA Z767 PSM standard.
- And that is where PSM adaptation and implementation started for pellet industry.

WorkSafeBC, WPAC and its members place the highest priority on workers' safety and health and does so by committing to continuous improvement and exploring and advancing effective and practical safety initiatives and achievable outcomes.

# STARTING POINT

Process Safety Management Elements (Credit: CSA Z767)			
Process safety leadership	Understanding hazards and risks	Risk management	Review and improvement
Accountability	Process knowledge and documentation	Training and competency	Investigation
Regulations, codes, and standards	Project review and design procedures	Management of change	Audits process
Process safety culture	Process risk assessment and risk reduction	Process and equipment integrity	Enhancement of process safety knowledge
Conduct of operations — senior management responsibility	Human factors	Emergency management planning	Key performance indicators

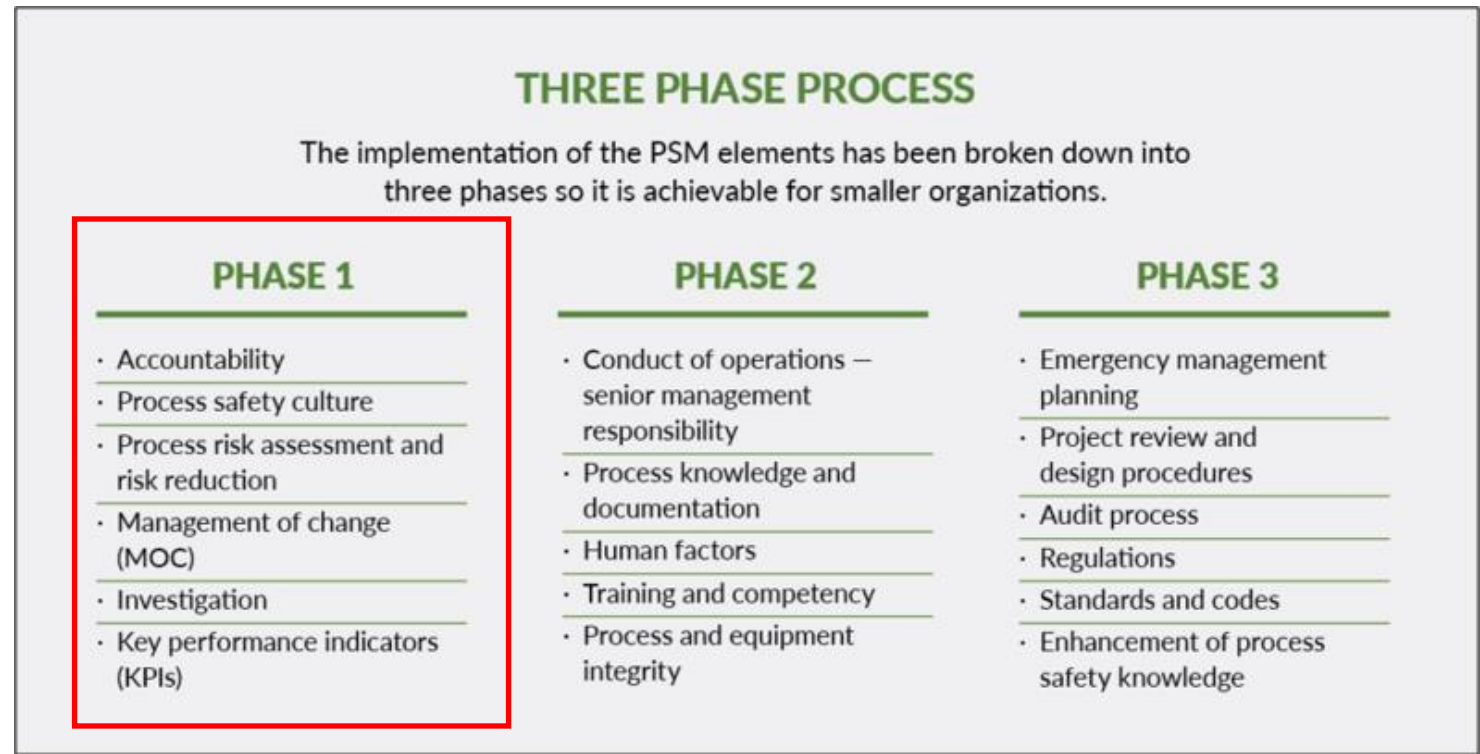


CSA Z767 standard was adopted as the guiding framework for PSM implementation.

1<sup>st</sup> edition: **2017**    2<sup>nd</sup> edition: **2024**

# PROGRESS TO DATE

- Execution team categorized original 16 PSM elements into 3 phases based on implementation priority.
- All self-assessment worksheets were developed and published online.



# 2026 STRATEGY: NARROWING THE FOCUS

- Steering Committee confirmed the need for a **practical and achievable workplan** for 2026.
- 2026 plan is narrowed to foundational execution work that supports later Phase 1 and broader PSM progress.

## FOCUS AREA DETAILS

### PROCESS SAFETY MANAGEMENT (PSM) IMPLEMENTATION

WPAC, in collaboration with BCFSC, continues to advance the Process Safety Management (PSM) initiative for wood pellet facilities. Building on the foundation laid by the 2023 project, *Integrating Process Safety Management into Canadian Wood Pellet Facilities that Generate Combustible Wood Dust*, funded through a WorkSafeBC Innovation at Work grant, the WPAC Safety Committee has undertaken several critical steps to ensure the effective implementation of PSM across the industry.

A PSM Steering Committee has been established to oversee the project and guide its strategic direction. Progress has been made, including developing a comprehensive implementation guide, work plan, and milestones with a timeline and detailed processes to support the adoption of PSM. The WPAC Safety Committee also developed self-assessment worksheets for PSM elements and sought industry feedback. The feedback received was implemented to enhance the tools' practicality and effectiveness. These efforts are designed to support wood pellet operations in identifying and addressing gaps in PSM practices.

#### Actions

Based on the implementation strategy outlined in the research project, the PSM implementation areas of focus for 2026 include:

- 1. Commitment from WPAC Safety Committee:** Reaffirm commitment to progress on process safety aligned with CSA Z767.  
**Target:** Q1 2026.
- 2. Hire a PSM coordinator:** The PSM coordinator will drive the project.  
**Target:** Q2 2026.
- 3. Process flow diagrams (PFDs):** Each plant develops/updates a PFD.  
**Target:** Q4 2026.
- 4. Management of change (MOC) self-assessment:** Each plant completes the MOC self-assessment, identifies gaps and initiates action planning.  
**Target:** Q4 2026.
- 5. Piping & instrumentation diagram (P&ID) gap identification and risk-based plan:** Each plant completes a self-assessment of P&ID status to identify missing and out-of-date P&IDs and to develop a 12-24-month action plan to close the gaps.  
**Target:** Q4 2026.

#### PROCESS SAFETY MANAGEMENT ELEMENTS

PROCESS SAFETY LEADERSHIP	UNDERSTANDING HAZARDS AND RISKS	RISK MANAGEMENT	REVIEW AND IMPROVEMENT
Accountability	Information and documentation	Training and competency	Investigation
Regulations, codes and standards	Project review and design procedures	Management of change	Audit program
Process safety culture	Risk assessment and risk reduction	Integrity management	Enhancement of process safety knowledge
Conduct of operations and operational discipline	Human factors	Emergency management	Key performance indicators

# 2026 EXECUTION TIMELINE

## Governance Alignment

Steering committee review, approval, and alignment on deliverables

*February 15 – March 30*

## PFD Development

PSM Lead conducts on-site document reviews and facilitates 2-day collaborative PFD workshops with plant teams.

*May 01 – September 30*

## Final Review

Technical review of deliverables, summary reporting, and roadmap development for 2027.

*August 01 – December 30*

## Company Engagement

Follow up with plants, formally assign a dedicated PSM Champion for every facility.

*March 15 – April 30*

## MOC and P&ID Rollout

Plants complete self-assessment worksheets, adapt MOC packages, and assess P&ID quality gaps.

*July 01 – November 30*

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# PFD DEVELOPMENT MODEL

1

Plant  
Readiness

2

Planning &  
Scheduling

3

2-Day Site  
Workshop

4

Review &  
Finalizing

# PFD: ULTIMATE BASELINE

## Defines Boundaries

Establishes precise safe operating parameters (temperature, pressure, moisture) for the plant.

## Enables Risk Assessment

Acts as definitive, shared baseline required for any future Process Hazard Analysis (PHA) or Bow-Tie mapping.

## Identifies Critical Equipment

Separates standard operational machinery from equipment specifically required to isolate or vent deflagrations.



## Master Rules to Develop Process Flow Diagrams (PFD) in Pellet Plants

**Document Control:** Prepared by Dr. Fahimeh Yazdanpanah (WPAC, PSM Lead) and Dr. Hamid Rezaei (Execution PSM Lead); Approved under Phase 3 WPAC 2026 Implementation Plan (Support Contact: [hamid@pellet.org](mailto:hamid@pellet.org))

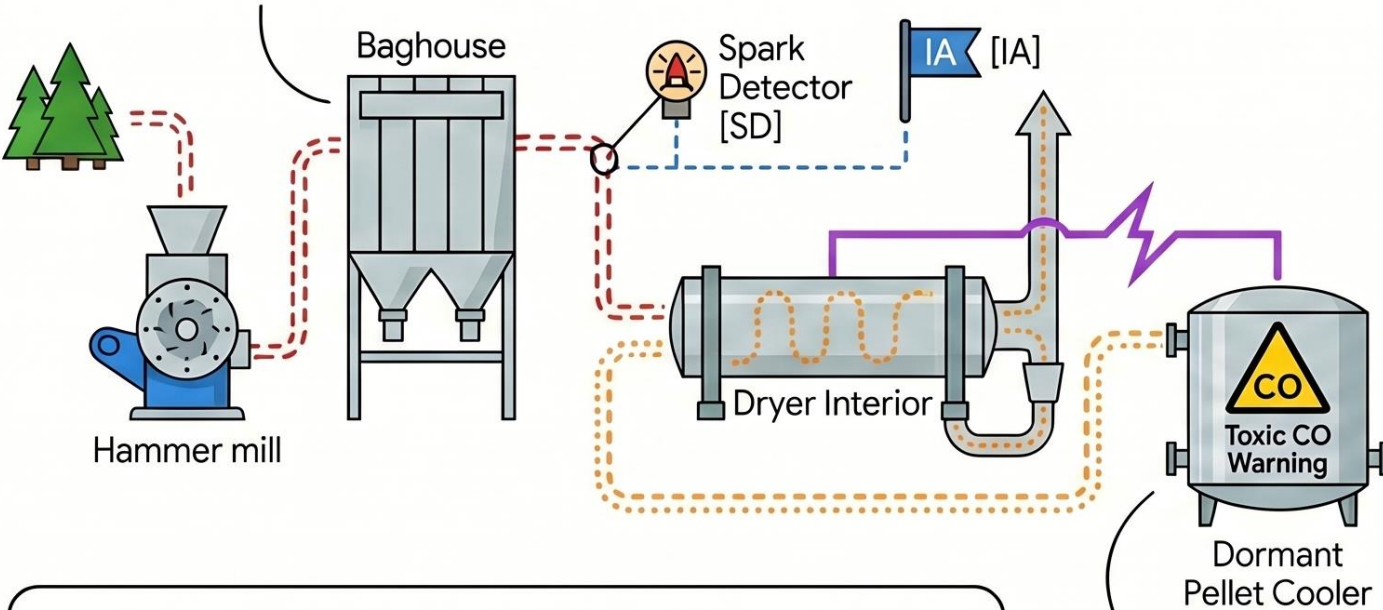
**Without a PSM-Ready PFD, hazard isolation is guesswork.**

# The Master Rules for Process Safety: Developing Wood Pellet PFDs

## Mapping the Invisible Hazard

Visualize Hazard States & Bypass Modes (Rules 1 & 2)

Overlay Safety-Critical Equipment & Utilities (Rules 3 & 4)



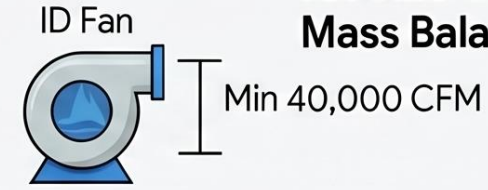
### Standardized Visual Toolkit for PFD Hazard Identification

- Suspended Dust / High Deflagration Risk  
e.g., Hammer mill discharges and baghouse inlets
- Syngas & Vapours / Explosion Risk  
e.g., Dryer interiors and RTO exhaust paths
- Non-standard / Emergency Bypass  
e.g., Routing dryer exhaust to atmosphere during cold startups

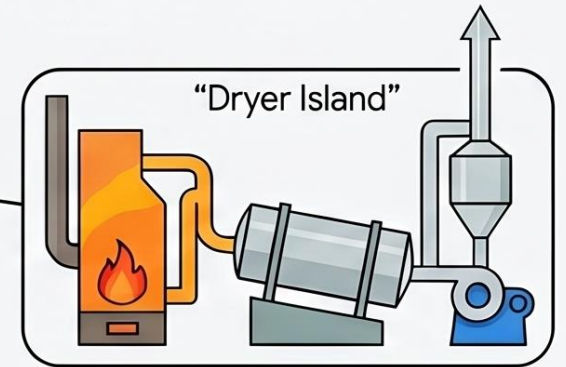
Identify Accumulation & Off-Gassing Zones (Rule 7)

## Validating the Safety Baseline

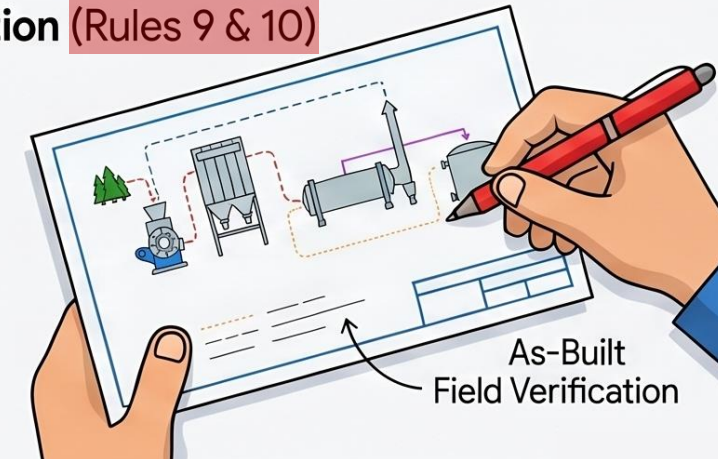
Set Safe Operating Limits & Mass Balances (Rules 5 & 6)



Segment the Plant into Analysis Nodes (Rule 8)



Perform "As-Built" Field Verification (Rules 9 & 10)



# MANAGEMENT OF CHANGE (MOC)

- Start with developed self-assessment worksheets review and use.
- Develop a standard MOC package.
- Train PSM Champions.
- Adapt the MOC system to plant operating realities.
- Begin local rollout and use.

**You cannot manage a change (MOC) if you do not have a formally defined baseline (PFD). Both are required to stop catastrophic escalation.**

## PSM INTEGRATION TOOL: SELF-ASSESSMENT & ACTION PLAN ELEMENT:

### MANAGEMENT OF CHANGE

February 2025

**1. Is a management of change (MOC) program in place?**

Yes (formalized)  Yes (informal)  No  Unsure

Action owner

█

Due date (yyyy-mm-dd):

█

Plans and actions needed to address gap or improve existing approach

█

**2. Does the MOC system manage risks associated with the following changes? Check all that apply:**

- Design changes
- Equipment changes
- Procedural changes
- Organizational changes
- Not applicable

Action owner

█

Due date (yyyy-mm-dd):

█

Plans and actions needed to address gap or improve existing approach

█

**3. If an MOC system is present, does it consider the following aspects? Check all that apply.**

- States what a change is.
- States what type a given change is (emergency or temporary).
- States what replacement-in-kind (RIK) is (which is not included in MOC).
- Considers changes in operating procedures or safe operating limits.
- Considers changes in the structure of the organization and staffing.
- A process for reviewing and approving changes.
- Includes a risk assessment of the change.
- Includes the communication of the change with relevant stakeholders before the change is made.

---

# GOVERNANCE AND EXECUTION MODEL

- **Steering Committee:** strategic direction, oversight, KPI review, and implementation guidance.
- **WPAC:** sponsor oversight, member coordination, stakeholder communication.
- **WPAC Safety Committee:** strategic and general direction, and oversight.
- **BC Forest Safety Council:** documentation support, storage, and audit process development.
- **Execution PSM Lead:** coordination of workplan, meetings, deliverables, site activities, communication and reporting.
- **Plant PSM Champions:** plant-level coordination, readiness, document support, and local follow-up.



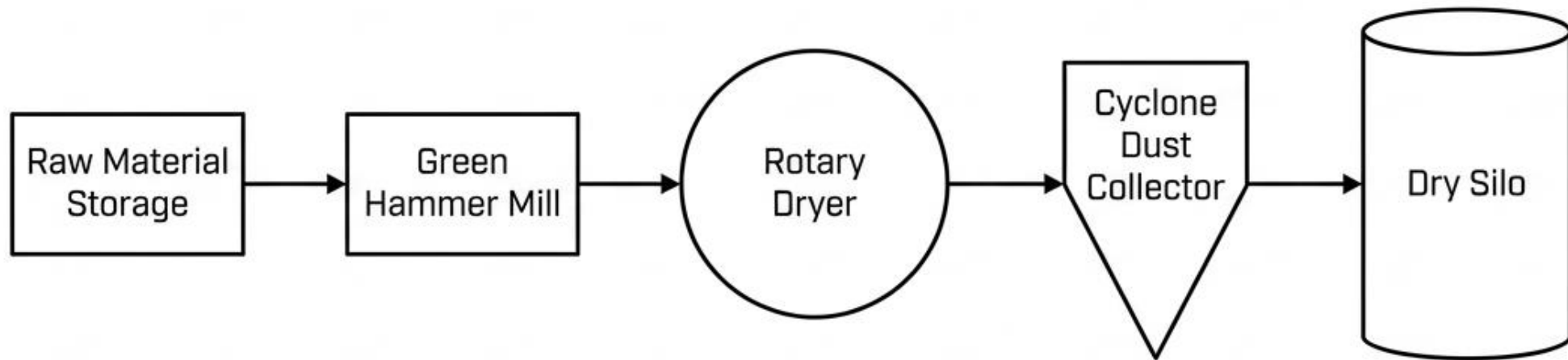
## **Case Study:**

### **PFDs & Management of Change (MOC)**

We want to think like a plant PSM Champion.

# PFD DIAGNOSTIC

- This is a standard representation of a pellet plant process.
- While it shows material flow, it is insufficient for PSM.



**What critical safety elements are missing in this schematic?**

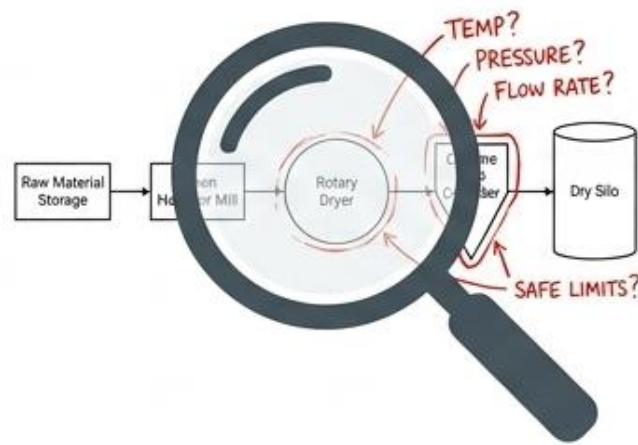
# DIAGNOSTIC QUESTIONS FOR PLANT CHAMPION

## 1. Where are the critical controls?



If a spark originates in the hammer mill, how does this diagram show us where **isolation valves**, spark detection, or explosion venting are located?

## 2. How can this PFD be improved for PSM?



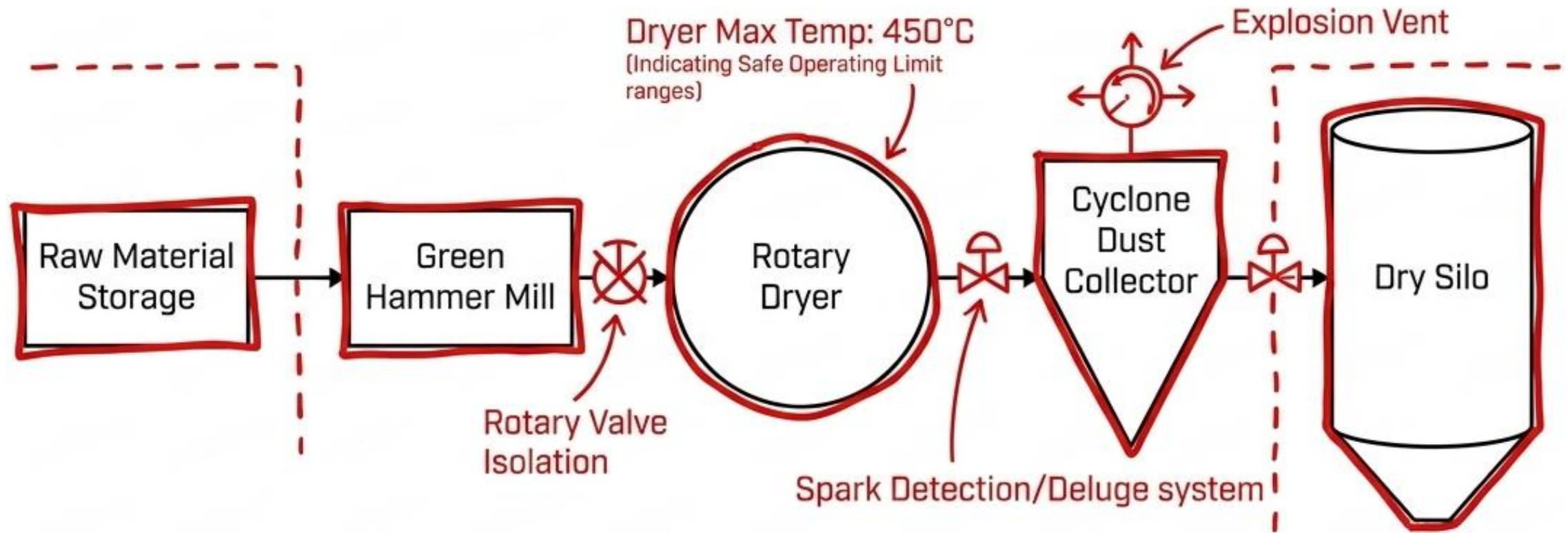
What missing operational data is required? (Hint: Think about Safe Operating Limits, temperatures, pressures, and flow rates).

## 3. Why is this step foundational?



If we handed this basic diagram to a HAZOP (Hazard and Operability) team tomorrow, **why would their risk assessment fail?**

# IDEAL PSM-READY PFD



- An accurate PFD maps both the process and the protective boundaries.
- It explicitly identifies Process Safety Critical Equipment.

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# WHAT ELSE?

## **Visualizing the Hazard State**

Use iconography to denote where fire, deflagration, or toxic synergy risks are present (e.g., dryer fire risk vs. silo self-heating).

## **Evaluating Bypasses & Transient Modes**

Show "Abort" lines or bypass loops used during start-up/shut-down to ensure the hazard state is managed during non-steady operations.

## **Establishing Safe Operating Limits (SOL)**

Define the "safe operating envelope" (Green/Orange/Red zones) for critical nodes like dryer moisture and pellet die temp.

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## WHAT ELSE? (CONT.)

### **Material and Energy Balances**

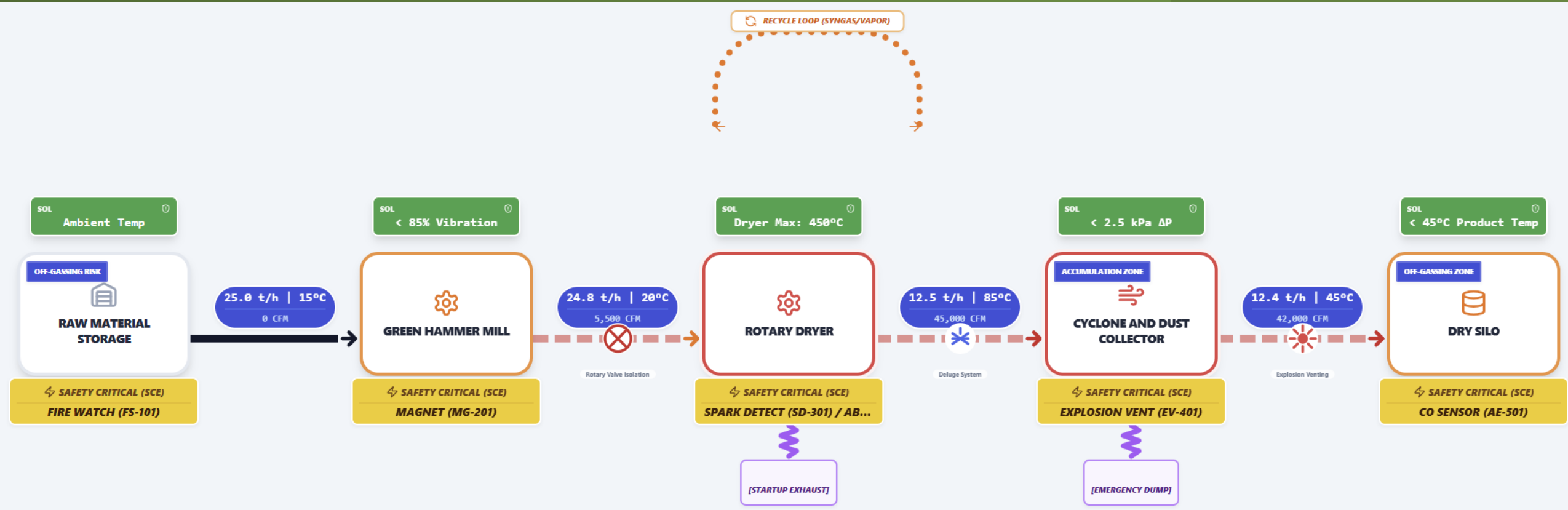
Link stream numbers to a data table showing mass flow and temperature to support explosion relief and fire load calculations.

### **Identifying Accumulation & Off-Gassing Zones**

Map locations where dust can settle or toxic syngas (CO/CH<sub>4</sub>) can pool, requiring specific ventilation or cleaning.

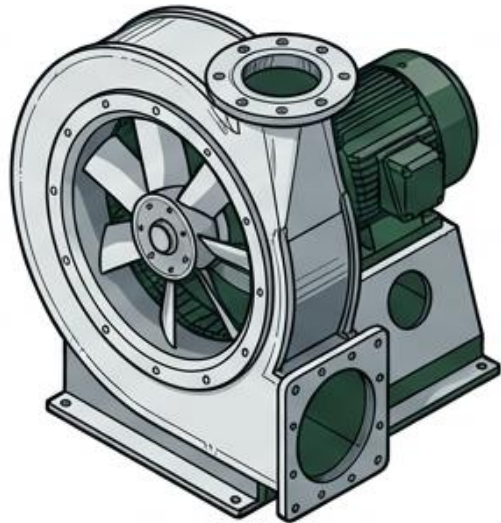
### **Node-Based Structuring for PHA**

Group equipment into logical "Nodes" (node 1: receiving, node 2: drying) to provide the structure for the Hazard Analysis team.



# CRITICAL ROLE OF MOC

A change in equipment size impacts air velocity, dust suspension, and electrical load. How does your facility currently manage this change?



**Scenario:** Replacing a failing 50HP Induced Draft (ID) fan with an available 75HP model to avoid a 3-day downtime.

**Reality:** Many plants have “informal” discussions about changes, but lack **documented hazard reviews or PSSR** (Pre-Startup Safety Reviews)

**Action Plan:** If you select “Yes (informal)”, the worksheet required a **documented action plan**.

1. Is a management of change (MOC) program in place?

Yes (formalized)  Yes (informal)  No  Unsure

In this example, there is no documented/formal MOC program currently in place, but there are discussions at the organization to develop and implement one. In this case, check “**Yes (informal)**” and include details for an action plan below to initiate the development process.

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# HEAR FROM FRANK

- **Shop Floor Insights:** Practical hazard analysis is strongest when driven by the hands-on experience of operators and maintenance teams.
- **Beyond Automation:** Technology and automated controls only succeed when supported by a workforce that deeply understands them
- **Cross-Functional Teamwork:** Bringing different operational roles together is the best way to build a shared understanding of risk
- **Continuous Learning:** Process safety isn't just a system; it is a vital tool for ongoing workforce development and practical decision-making



**Frank (Son of the Most High) Wall** · 1st  
Plant Superintendent at Premium Pellet Ltd with the organization since  
Sept 7, 1977

Vanderhoof, British Columbia, Canada · [Contact info](#)

[www.pelletwise.net](http://www.pelletwise.net)

**Please contact WPAC / project team for questions, comments and/or follow-ups:**

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# What's new with you?

Wood Pellet Association of Canada  
Annual Safety Summit  
June 9, 2026

Mike Tasker, CRSP

Supervisor, High Risk Operations, Risk Management & Compliance

WorkSafeBC

# What we'll talk about

- Prevention re-alignment
- Combustible dust regulation implementation
- Psychological safety focus
- Musculoskeletal Injury focus
- Process Safety Initiative
- Mega-projects Initiative
- Emergency preparation regulation update
- Occupational Compliance Officers & Sustained Compliance Initiative
- New clarification and tools on heat stress regulation.

# Prevention re-alignment

- Planning began in 2024
- Implemented in 2025
- Prevention Field Services divided into 3 streams
  - Occupational safety in primary resources and manufacturing
  - Occupational hygiene and construction
  - Health care, psych safety, retail, government, etc.
- Purpose:
  - To create a more focused experience for employers and workers.
  - To create specialization, alignment and greater understanding of stakeholder needs.
  - Better delivery of WorkSafeBC resources.

# Musculoskeletal Injury focus

- A renewed focus on reducing the number and severity of MSI injuries across many employer sectors.
- MSI's account for 30% of all WorkSafeBC claims
- Over the past 5 years, MSI's have:
  - Accounted for 88,000 claims
  - \$2.35 Billion in employer claim costs

# Combustible dust regulation implementation

- New regulation goes into effect January 4, 2027
- Much broader in its scope.
- Requires a qualified person to be involved.
- Broader requirements for risk assessment and CD management programs.
  
- Are you ready?

# Psychological safety focus

- Psychological safety is an emerging issue across all workplaces.
- Estimated to cost Canadian economy \$180 billion per year.
- WorkSafeBC has established teams of officers to guide employers and workers through a psychological safety complaint
  - We don't investigate to allegation.
  - WorkSafeBC Bullying and Harassment Officers are specially trained to:
    - Make sure the employers investigate properly and implement effective corrective measures.
    - Ensure all employer's have policies, procedures and training to prevent bullying and harassment.
- New regulations under development.

# Process Safety Initiative & Team

- WorkSafeBC has positioned process safety as a key component in its risk management philosophy.
- Significant investment in focus areas, risk management and resources are being planned.
- A new process safety strategic plan is under development.
  - Greater analysis of risk signals and intelligence.
  - New strategies, new areas of focus, new team members.

# Mega-projects Initiative

- WorkSafeBC is developing a new Mega-projects Initiative.
- The initiative will bring a consistent approach to the “biggest of the big” projects, like:
  - Pipelines,
  - Bridges,
  - LNG development
  - Skytrain expansion projects
- The initiative will:
  - Provide greater consistency in our engagement with these large projects,
  - Will leverage enterprise-wide resources to respond to the needs from these sites.

# Emergency preparation regulation update

- New regulations came into effect in 2024.
- New regulation was overlooked by many employers.
- Requires:
  - Broader emergency planning based on risk assessments.
  - Maintaining current inventories o hazardous substances.
  - Written emergency response plans,
  - Procedures for notification of nearby locations in the event of an emergency,
  - Safe work procedures for responding to spills
  - Greater training of workers
  - Drill to practice procedures
- Have you looked at your emergency preparedness?

# Occupational Compliance Officers & Sustained Compliance Initiative

- New initiative and specialized team to evaluate sustained compliance for selected hazards and employers.
- 4 new Occupational Compliance Officer (OCO's) positions created.
- OCO's will be deployed across BC to focus on specified industries and issues.
- Learnings will inform future prevention risk management strategies.

# **New clarification and tools on heat stress regulation.**

- Over to you, Geoff....

---

# WHAT WILL YOU DO DIFFERENTLY TOMORROW?

- Think about ergonomic risk factors
- Be more vigilant about sources of vibration
- Make sure I have proper posture on my drive to work and while sitting in my chair
- Time duration operating tools with micro breaks
- Watch my texting/phone use posture
- Keep maximum weights in mind
- Begin deeper assessment of work to determine better ergonomic controls
- Discuss ergonomics with workers and safety committees more often
- Slow down, stop to think about factors outside the normal and communicate
- Think about updating MSI assessments as jobs change through the years
- Be more considerate of hand arm vibration stress
- Think more about posture, ergonomics and duration of operating tools
- Do a better job with my personal workstation. Better setup and posture
- Review operator working postures
- Shorten time operating my resp saw
- Select tool use based on vibration values, task and duration of use



**WOOD PELLET**

ASSOCIATION OF CANADA