



Integrated Solutions



**Greater Emphasis On Safety:
New and Existing Plants Are Calling for It**

About Cogent

Our Mission:

Empowering our clients to achieve a safe, reliable and efficient operation

Our Achievements:

Recipient of over 20 awards and rankings



Vancouver, BC Canada



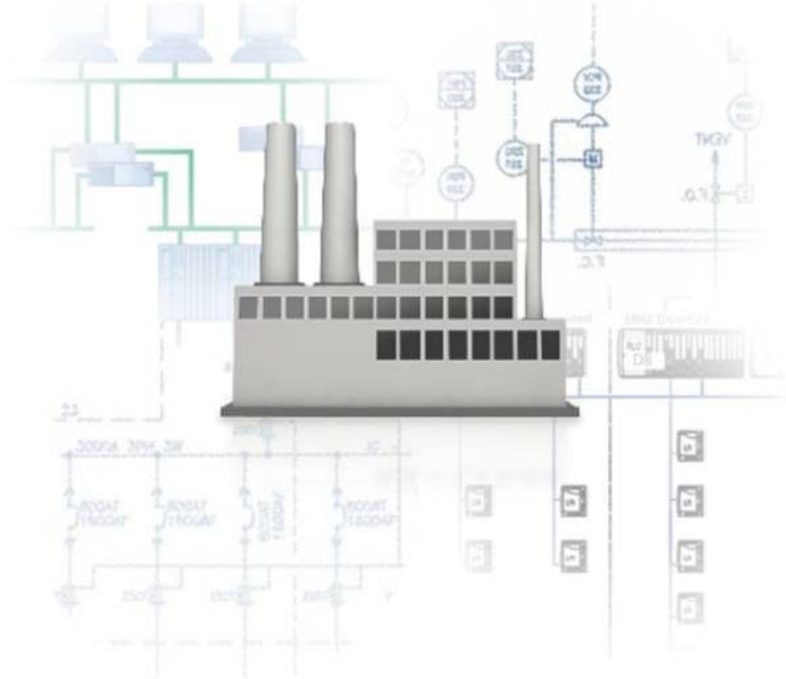
Project Services & Solutions

Plant-wide

Electrical Power Systems

Controls and
Automation

Fire Safety



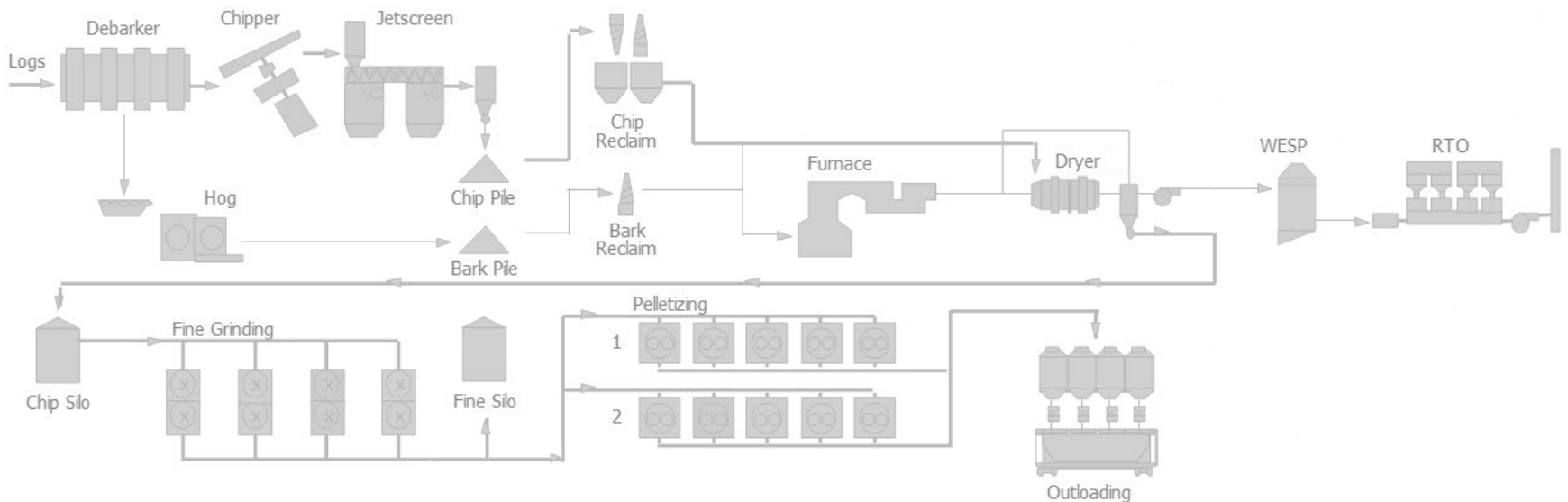
Project Management

Industrial IT

Monitoring Systems

Biggest Safety Challenge in Industrial Pellet Industry

» Fire & Explosions



- » The wood processing industry is very focused on improving Fire Safety through better implementations and practices.

How does a Fire or an Explosion Start



Fire



Dust Explosion

Fire Safety Goal is to Protect People and Assets!

People:

- » Fire alarms
- » Fire containment to stop the spread
- » Clear evacuation route to assembly points
- » Training

Assets:

- » Protecting the expensive and long lead equipment
- » Protecting the building
- » Quick recovery from fire

A Holistic Approach to Fire Safety

Recovery

How quickly can we recover and get back to production.

Response

Emergency evacuation and notifying fire brigade.

Mitigation

Containment and keeping away from critical assets (e.g. Fire walls & explosion hatches).

Protection

Deployment of automatic fire protection systems such as sprinklers, deluge and foam systems.

Prevention

Reducing the probability of a fire (by taking away one of three elements i.e. oxygen, fuel and ignition source).

Prevention

- » Take away ignition or heat from wood <15% MC
- » Avoid ignition source inside dusty equipment
- » Use purge air to get the combustible fuel out of dryer
- » Use fans to avoid accumulation of dust on structures
- » Apply area classifications
- » Operating within design limits
- » Good housekeeping and maintenance plan



Area Classification			
	Flammable Material Present Continuously	Flammable Material Present Intermittently	Flammable Material Present Abnormally
IEC/EU	Zone 0	Zone 1	Zone 2
US NEC® 505 NEC® 500	Zone 0	Zone 1	Division 2
CA CEC Section 18 CEC Annex J	Zone 0	Zone 1	Zone 2
		Division 1	Division 2

IEC classification per IEC 60079-10
EU classification per EN 60079-10
US classification per ANSINF PA 70 National Electrical Code® (NEC®) Article 500 or Article 505
CA Classification per CSA C22.1 Canadian Electrical Code (CEC) Section 18 or Annex J.

Protection

- » Building Sprinkler System(s)
- » Equipment Deluge System
- » Foam System (Hydraulic rooms)
- » Spark Detection & Suppression (Ignition source)
- » Nitrogen Blanket or Inert Gas Suppression



Mitigation

- » Fire walls & blast walls (explosions) - preventing spread
- » Sealing of wall penetrations
- » Pressure relief from explosions (e.g. hatches, Arc flash venting)
- » Arc flash ductwork
- » Fireproofing of some cables (FT ratings)



Response

- » Building fire alarm system for emergency evacuation
 - Manually triggered by plant personnel
 - Integrate fire risers flow switches
 - Automated detection of fire or smoke in high-risk areas
- » Controlled shutdown (in the event of a major failure and orderly recovery)
- » Ensure means of escape: exits, lighting and muster points.
- » Alert fire brigade
- » Coordination and communications (e.g. contact numbers)

Recovery

- » Recovery plan
 - Contractor
 - Vendors support
 - Procurement
 - Insurance
 - Communications
- » Access to documents and software that were stored safely
- » Replacement parts availability

Areas to focus on for Fire Safety

- » Civil & Building
- » Dry Material Handling
- » Process Control
- » Hot Oil & Hydraulics
- » Equipment Reliability
- » Operator Effectiveness
- » Electrical

Civil & Building

Response

- » Proper building exits
- » Pull stations

Mitigation

- » Fire & blast walls
- » Penetration sealing

Protection

- » Building sprinklers
- » Fans to prevent dust settling

Prevention

- » Avoid flammable materials
- » Hazardous Location



Process

Equipment

Personnel

Dry Material conveying

Response

- » HMI alarm

Mitigation

- » Explosion hatches
- » Fire dumps

Protection

- » PT 100 c/w sprinklers
- » Spark detection

Prevention

- » Conveyor designs (ignition sources)



Process

Equipment

Personnel

Process Control

Response

» HMI alarm & notify

Mitigation

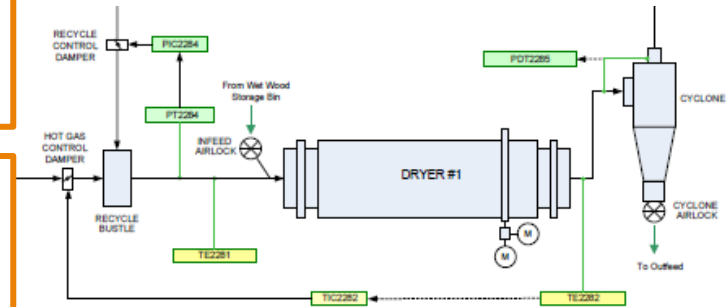
» Automatically divert to fire dump

Protection

- » Corrective controls brings temperature back into normal range
- » Notify the operator of the process condition to take corrective action
- » Spark suppression

Prevention

- » Operating the dryer at the right temperature and throughput
- » Monitor temperature and plugs



Process

Equipment

Personnel

Hot Oil & Hydraulics

Response

- » Horn & HMI alarm

Mitigation

- » Fire walls
- » Containment

Protection

- » IR & flame detection
- » Foam suppression systems

Prevention

- » Temperature monitoring
- » Leak detection



Process

Equipment

Personnel

Equipment Reliability

Response

» HMI alarm & notify

Mitigation

» Safe and orderly shutdown

Protection

» Fail safe design

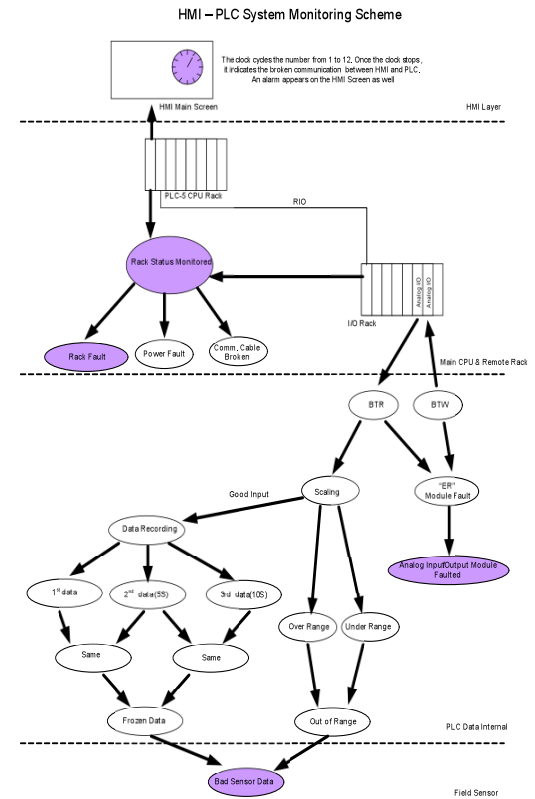
Prevention

- » Build in power and communication reliability and quality
- » Monitor PLC systems and equipment
- » Integration with fire systems

Process

Equipment

Personnel



Operator Effectiveness

Response

- » HMI alarm & notify

Mitigation

- » Controlled shutdowns
- » Auto fire dump

Protection

- » Auto mode change

Prevention

- » Effective operator training – simulation training
- » Intuitive interfaces
- » Detect and prevent error entries or commands
- » Manual Interlocks



Process

Equipment

Personnel

Electrical

Response

- » HMI alarm & notify

Mitigation

- » Arc flash venting
- » Remote switching

Protection

- » Over current protection & temperature sensors
- » Arc flash suits or remote switching

Prevention

- » Power & arc flash labeling
- » Grounding & bonding
- » Vertical mounting of tray (reduce dust buildup)



Process

Equipment

Personnel

Implementing Fire Safety Solutions

Having a holistic and integrated approach to **Fire Safety** is key to achieving effective prevention, protection, mitigation, response & recovery.

Recovery

How quickly can we recover and get back to production.

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Protection

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Prevention

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