

# CASE STUDY:



## PROTECTION STRATEGY IN WOOD PROCESSING FACILITIES

### Panel Board Plant Safety Project

AIRPLUS Industrial partnered with IEP Technologies, the global experts in Industrial Explosion Protection, to complete the first phase of a major plant protection project for a leading North American manufacturer of panel boards in Western Canada.

### Assessing Potential Risks

With several facilities across Canada and the USA, the end-user became acutely aware of the potential for explosions created in their production processes by the uncontrolled ignition of fine wood particles and dusts. Corporate management concluded that the risks to personnel safety, production losses and downtime, as well as the wider environmental concerns for the local community were simply not acceptable and therefore embarked upon a review and upgrade of their entire manufacturing process.



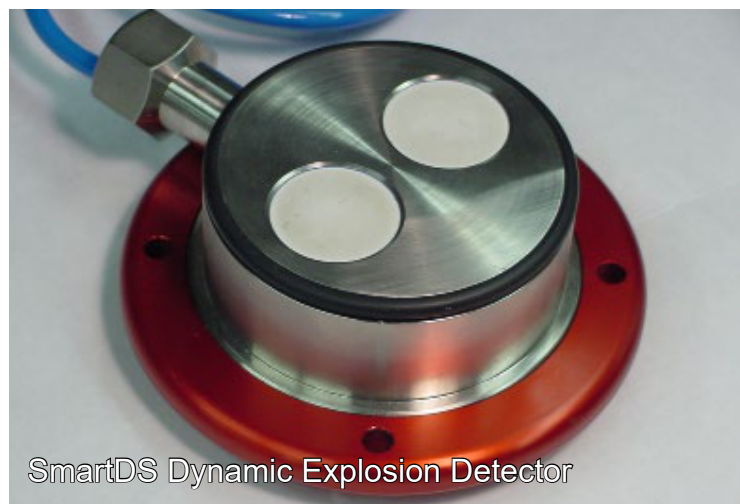
### Determining Risk Potential

Although it is generally accepted that wood product manufacturing creates potentially combustible dusts as a consequence of the production process, the first stage of IEP's review required 7 dust samples to be collected from different stages of the plant, in order to determine the exact explosive characteristics of the material. These tests were conducted at IEP's own "Combustion Research Centre", an independent laboratory specializing in the combustion characteristic testing of dusts, liquids, and gases. A subsequent engineering review by IEP determined more than 30 vessels and wood-processing specific production machines were identified as needing to be included in the protection strategy. This included cyclones, dust collectors, weigh hoppers, fibre bins, and forming heads along with connecting conveyors and ducting. The scale of the

project required a considerable amount of pre-work to be conducted by sales, support and application engineering teams, involving no less than 5 visits to site to ensure understanding and the end-user's complete satisfaction with the design concept.

### Providing an Integrated Safety Net

From the outset, the objective was to provide an *integrated safety net* for the plant to protect not only against the devastating effects of explosions, but also to safeguard against spurious activations and costly production shut-down caused by occasional over-pressure conditions in the process line. The protection, suppression and control systems proposed by IEP required reinforcement or upgrade of several older, unprotected vessels and machines where the pressure rating was insufficient to enable the developing explosive effects to be safely vented and controlled.



### Specific Technical Challenges

#### Measuring rate of pressure change vs just pressure

One specific technical challenge encountered was the fact that as the process line is pressurised, dynamic pressure detection would be required to differentiate between normal process pressure fluctuations and actual explosion events. IEP proposed their "SmartDS" Dynamic Pressure Detection System to fulfil this requirement. The SmartDS is a rate of pressure rise detector and uses multiple algorithms that constantly interrogate pressure data to allow explosion detection while providing excellent false alarm immunity. The SmartDS is SIL 2 certified and ATEX approved.

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### Weighing Design Options

After presenting various plant protection proposals, the customer opted for the one which offered the very highest level of safety, which included 25 zones of protection incorporating explosion venting, detection, suppression and isolation, linked back to four of IEP's EX8000 Multi-Channel control systems.

### Key Features

A key feature here was also the fact that each EX8000 Controller can handle up to 16 zones, therefore building plenty of scope for future plant expansion into the current installation.

The integrated protection system combined several elements including passive explosion venting for outdoor vessels, together with detection, suppression and isolation to safeguard against the propagation of explosive products to interconnected vessels and machines, and the associated risk of secondary explosions.

### After Market Support

Although IEP has over 60 years' experience in the specialised field of Industrial Explosion Protection, in view of the significant investment being made in protecting their assets, the end-user commissioned an independent 3rd party study by a competent safety engineering group who fully validated the approach proposed by IEP. The large scale of the project also dictated that several "Mechanical & Engineering" teams were required and these were coordinated by an experienced Dust Collection System Integrator while the local IEP service centre maintained an inventory of genuine spare parts for any urgent requirements or periodic maintenance.

### Looking Ahead

Looking ahead, IEP will be working with the end-user to train their local engineers to enable them to investigate and identify issues in any other company lumber mills and board plants across North America.

### Scale & Scope of Capabilities

The scale and scope of the project neatly illustrates the specialized nature of IEP's and AIRPLUS Industrial's capabilities as a Trusted Industrial Explosion Protection Partner and the extent of those capabilities in testing comprising materials, engineering review and design, system supply and ongoing maintenance, training and support.

The Marlborough, MA based company is part of the global HOERBIGER Safety Solutions network, with sales, service and support centres located across North America, Latin America, Europe, Middle East/Africa and Asia/Pacific.



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