Low Pressure Watermist UK Installation

Presented by Dean Reeve – UK Operations

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The Project Overview

Description

- The site is a wood fibre processing and mixing plant with associated offices and outbuildings operating on a 24/7 basis.

- The UK Design and installation partner was: Xcell Misting Ltd.

- Protected areas

  Offices: VID Fire-kill - Automatic Nozzles.

  Processing, mixing and storage areas: VID Fire-kill Fleet System.

The Site Plan

Fibre Storage
Full LPWM
Coverage

Process Building
Full LPWM
Coverage

Full LPWM
Coverage

Full HPWM
Coverage

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The Presentation Focus Area

- For this presentation, we have chosen to concentrate on one of the higher hazard areas of the site, which is the **Storage Shed** building.
- **The Storage Shed** contains some challenges.
  - *Machinery.*
  - *Vehicles.*
  - *Loosely piled fibrous product.*
  - *Building height.*
  - *Varying fire fuel heights.*
  - *Open ended.*

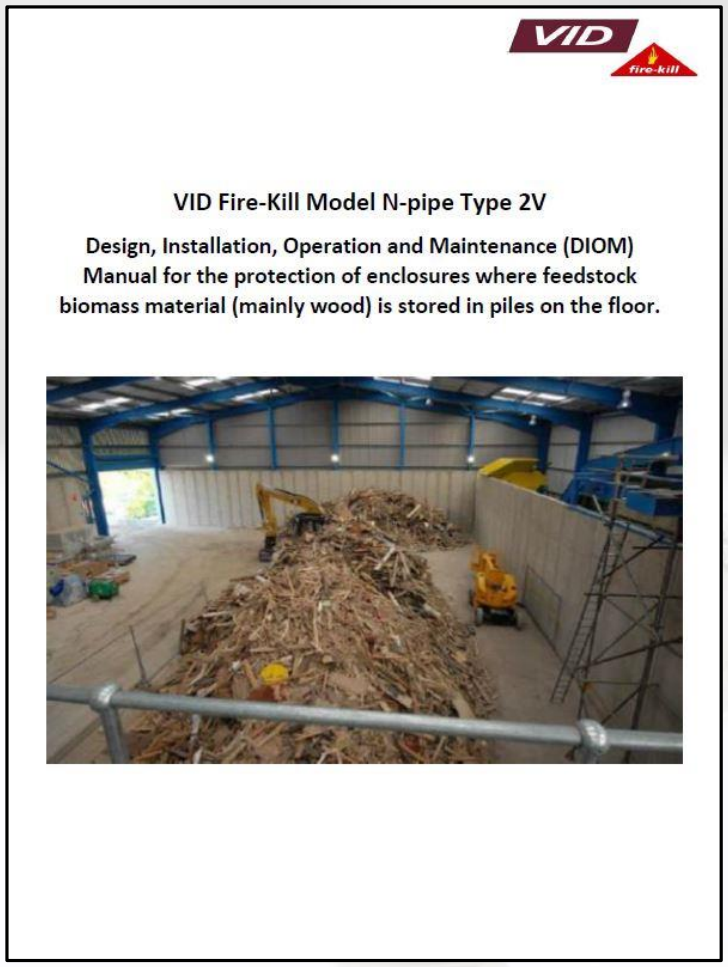
The Presentation Focus Area

- **The Storage Shed** contains an auger that moves pulped wood from an adjacent process area.
- **The fibre** has a texture similar to cotton wool.
- **The fibre** is dyed with a product derived from recycled tyres.
- **The fibre** is loosely stored in a pile that varies in sizes at different times during the manufacturing process, and there is plenty of oxygen available to help the fire cycle.
- **The Storage shed** is completely open to the elements at one end.

The Fibre Storage Shed

Dimensions – Length = 37 Metres. Width = 10 Metres. Height = 9 Metres

The Fibre Storage Suppression System



Once all the design and site information was gathered, it was proposed to select the VID Firekill Fleet System, based on the 2V N Pipe arrangement.

System overview
System Design – VID Firekill DIOM
System Type – Zoned Deluge
Detection chosen – Coincidence Flame Detection

System Arrangement – First Knock Flame Detection covers the main area and the second knock pinpoints the fire zone. The system opens the correct valves and the system is active deluging the area.

Tested to DFL Test Method DFL TM 90329-03 with amendments 150225-2.

The 2V Fleet Suppression System

Datasheet
Deluge system for Biomass storage areas.
Model: N-pipe Type 2V

Description

The VID Fire-Kill low pressure, fine water spray deluge system Model N-pipe Type 2V was created for the protection of many different applications. This datasheet covers the use of Model N-pipe Type 2V in large indoor spaces where biomass feedstock (mainly wood) is stored in potentially large piles.

The Model N-pipe Type 2V system has been designed with a modular approach in mind, which lowers the time required when designing and installing the system and makes it easier to incorporate into existing locations. To further ease installation, the systems utilize Model N-Pipe Type 2V of ordinarily 6 m in length. Each 6 m length of N-pipe is fitted with 12 low pressure fine water spray nozzles (Model BM-1-28 nozzles) designed specifically for the location size. Two nozzle pairs are installed for every meter in a 90° V-shape formation with 0.5 meters to each pipe end.

Model N-pipe Type 2V systems are installed in parallel rows covering the entire enclosure, either in a total flooding design where all pipes are connected to the same riser pipe, or in zones where each zone of N-pipe Type 2V is connected to a zone deluge valve.

Tests and Applications

N-pipes Type 2V has been tested to a long list of different protocols. To proof its use as biomass storage area protection system, N-pipes Type 2V has been successfully tested to DFL test method 90329-3 with amendments 150225-2, both designed accordingly to CEN/TS 14972 annex B.

Based on the testing the N-pipes Type 2V can protect dry or wet feedstock material typical with sizes less than 150mm in any dimension, and stored in piles up to 8m height.
The feedstock mainly consist of clean wood residues from forestry or other wood processing activities, including bark, chips, sawdust, and shavings; and recycled wood.

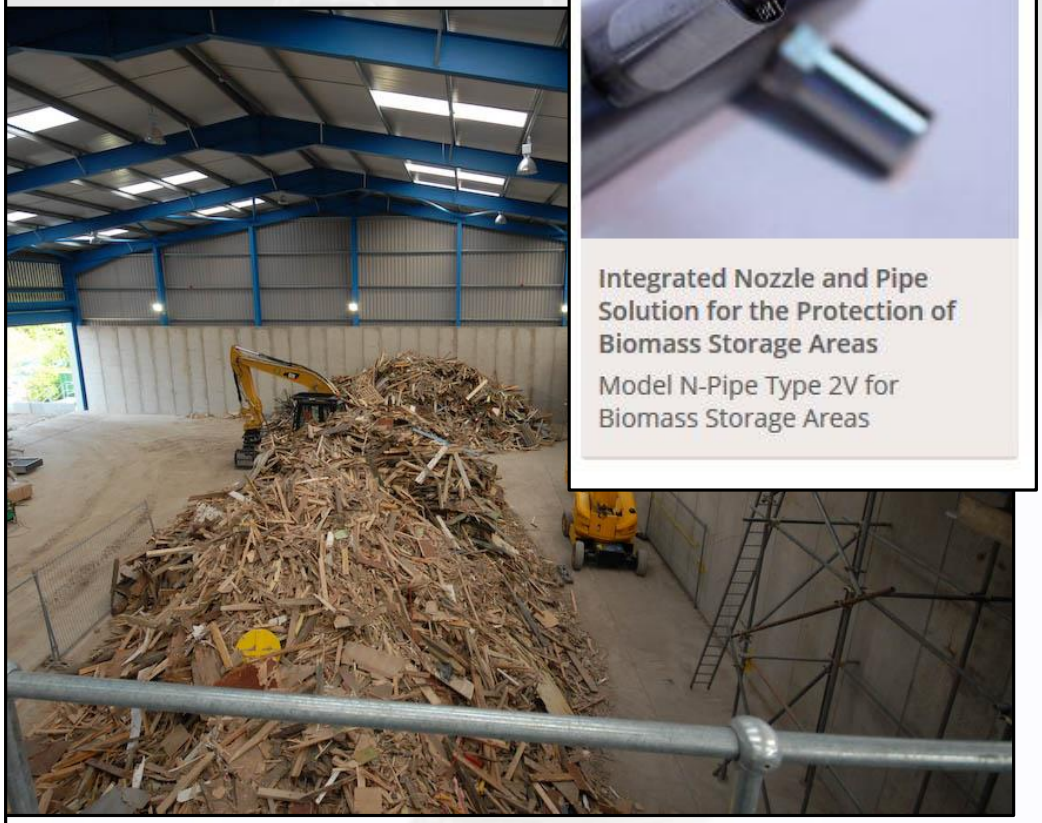
Contact

For further information on the N-Pipes or similar nozzles, please contact our sales department at Sales@vidaps.dk

Overall Technical Data		
Application	Biomass storage areas	
General Stats		
Minimum water pressure	4 bar	
Maximum water pressure	16 bar	
K-factor 6m N-pipe Type 2V (metric)	33.6 (l/min/√bar)	
K-factor per micro nozzle	2.8 (l/min/√bar)	
Nominal flow at minimum water pressure	67.2 l/min	
Drop size	DV_{90}< 300 µm	
Application		
Nozzle Spacing on N-pipe (max)	1 m	
N-pipe spacing (parallel)	3 m	
Installation height over wood piles	Min	4.0 m
	Max	10 m
Specific Stats		
Pipe Dimensions	Ø25x1.2mm or Ø28x1.2mm	
Weight	1.45 kg	
Pipe material	AISI 316L	
Micro Nozzle material	AISI304 or AISI 316L	
Pipe ends	3/4" male/female ends or	
	28mm Open ends prepared for press fittings	
Hydraulic System		
Design area	4 zones (min. 90m² coverage per zone) or 360m²	
Water density (area 3m x 6m)	3.7 mm/min	
System operation time	> 90 min	
Related Products		
Name	Model	
Control Valve	C-EL deluge valves	

VID Fire-Kill ApS,
www.vid.eu

Doc Name: Datasheet N-pipe Type 2V for Biomass
Doc No.: 150508-01-01
v.1
Issue/ Date: 8th May 2015
Page: 1 of 1



Integrated Nozzle and Pipe Solution for the Protection of Biomass Storage Areas

Model N-Pipe Type 2V for Biomass Storage Areas

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The 2V Fleet Suppression System

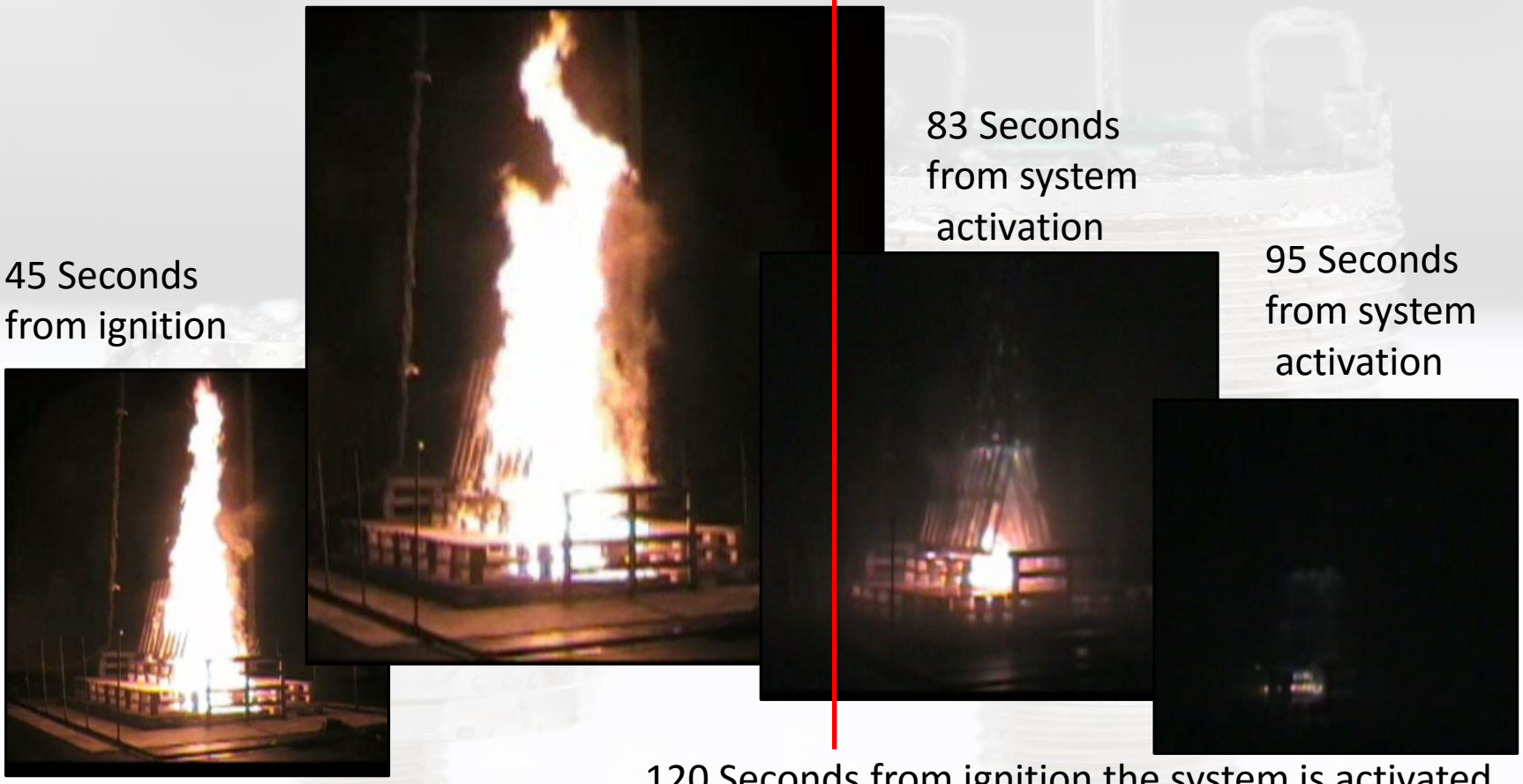
- Test Pictures

72 Seconds from ignition

83 Seconds from system activation

45 Seconds from ignition

95 Seconds from system activation



120 Seconds from ignition the system is activated

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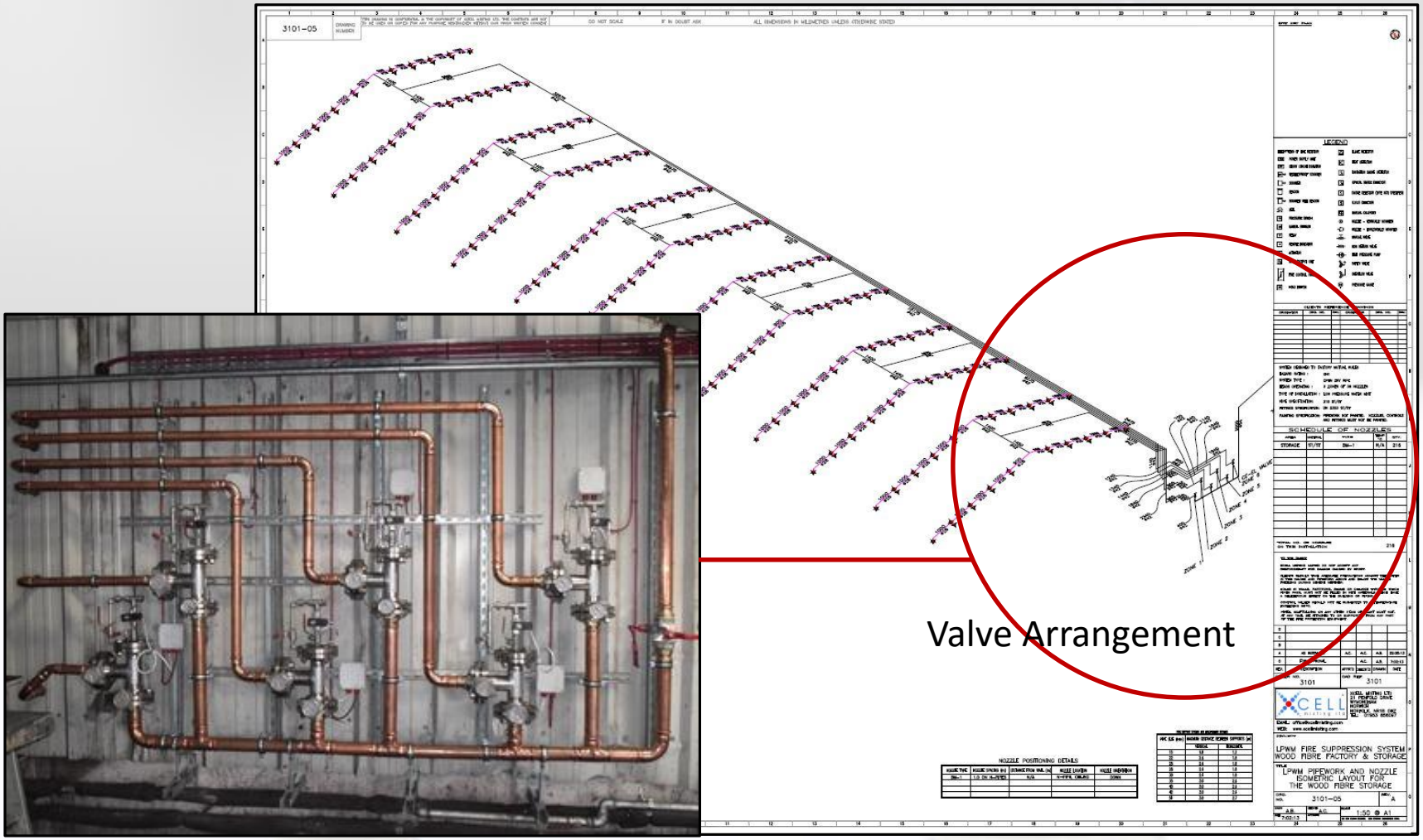
VID

fire-kill

The 2V Fleet Suppression System

- Spray Pattern Demonstrations

The Site Fleet System Layout



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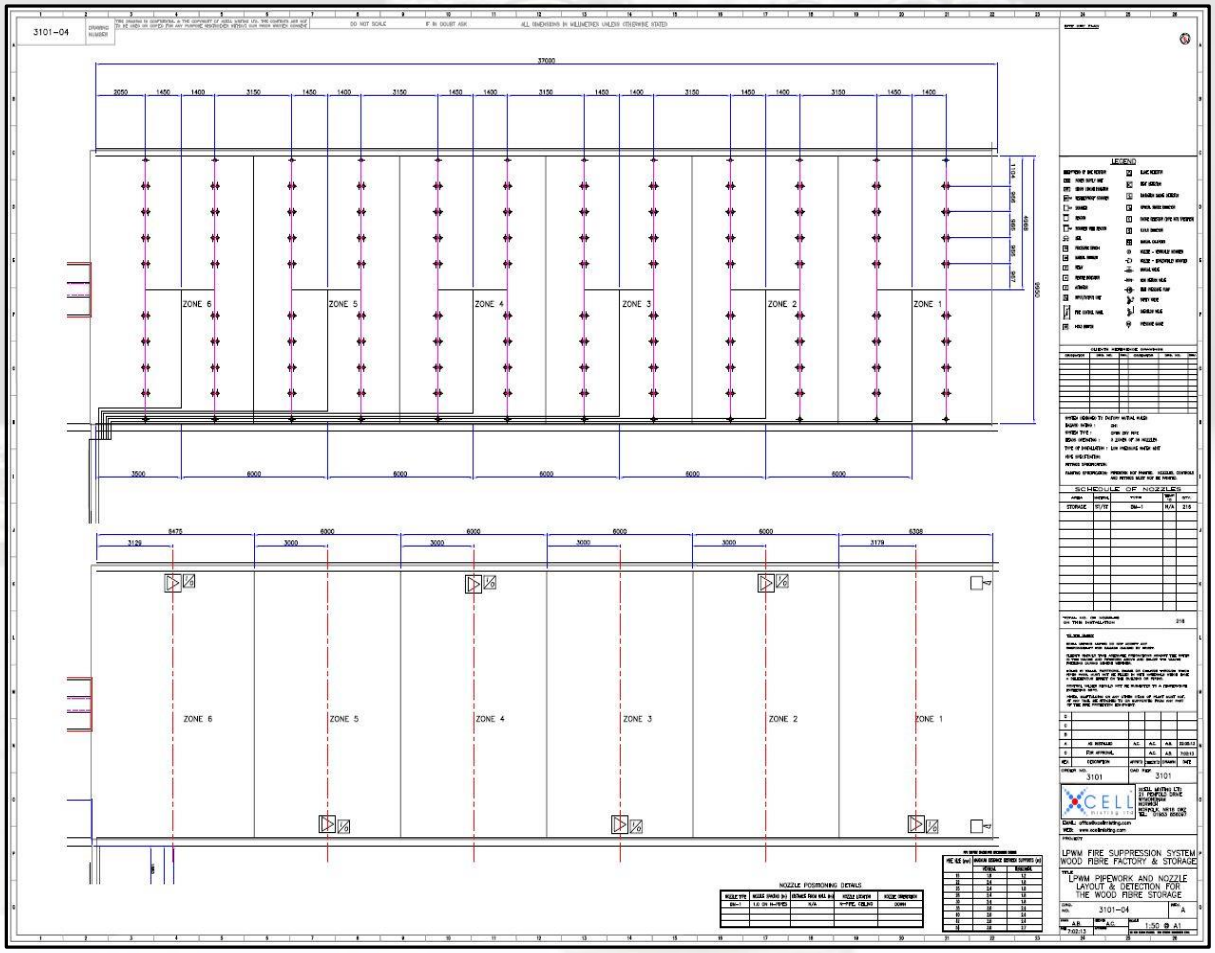
The Fleet System Zone Layout

- 6 Zones
- 3 Operating
- 203 lpm per zone
- 4 bar minimum on all nozzles.



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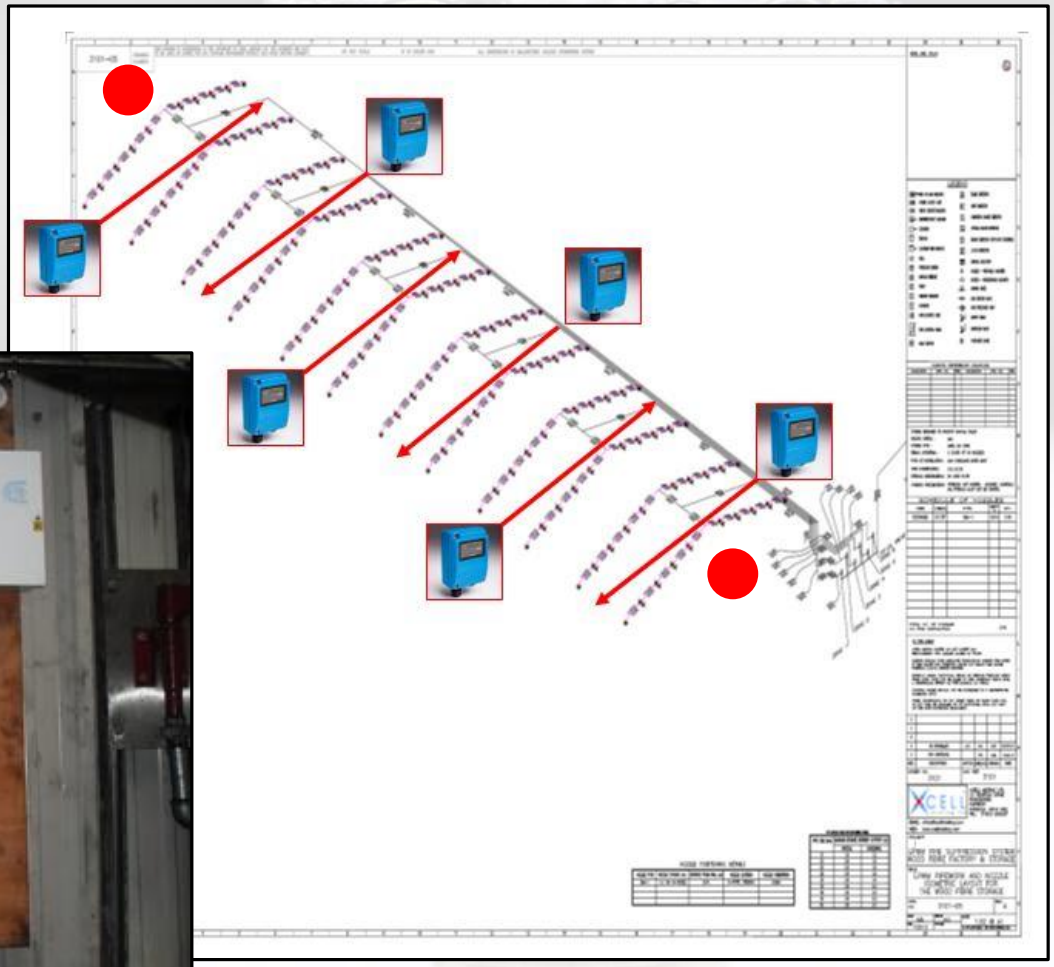
The Fleet System Zone Detectors

- 6 x Zone Detectors
- 2 Monitoring



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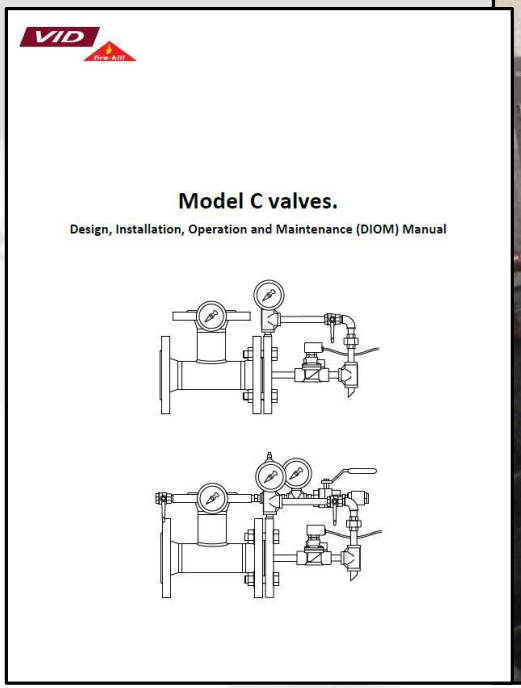
Pump, Tank, Valves

2 x Full Duty Pumps

1 x Pressure Maintenance

6 x C-EL Valves



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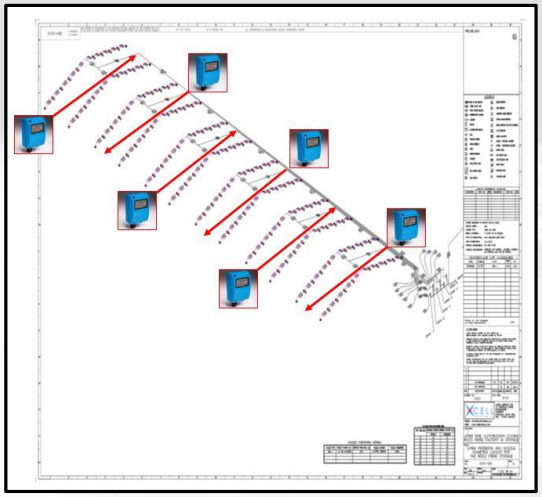
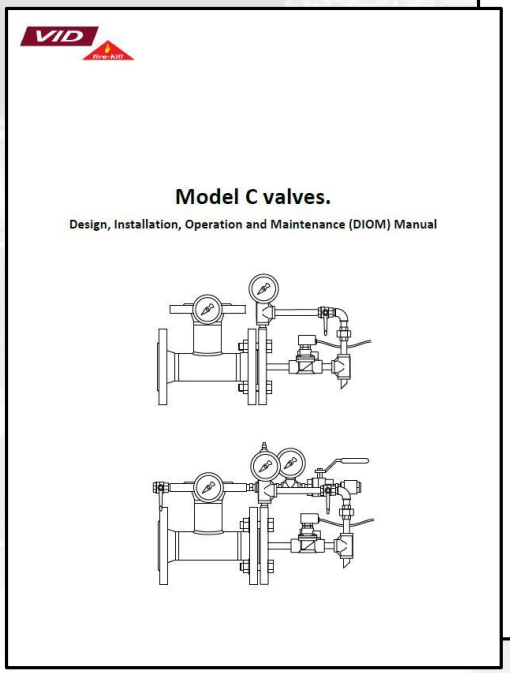
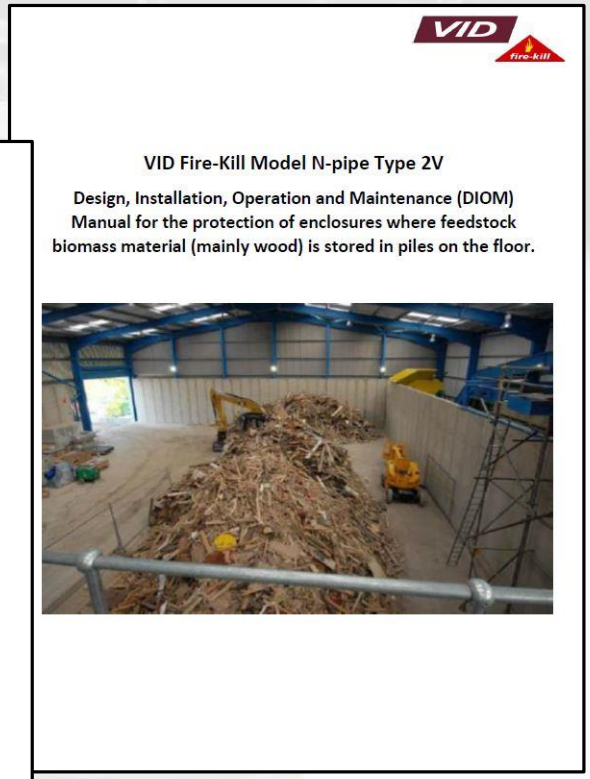
Commissioning

- Full discharge tests were undertaken as part of the commissioning tests of the system.







Call to Action

- A Fire started in the Auger below the ceiling walkway when some bearings overheated and ignited the product on the Auger and dropped into the pile.
- The Fire was partially shielded by the walkway.
- The Fire was sensed early by the flame detection.
- The system opens and the fire was extinguished at an early stage.
- The Fire Brigade attended from the monitoring system alert, but no intervention was required as the fire was extinguished.

Second call to Action

- Fire 2
- Started when a vehicle came into the area and it is suspected the heat, or spark from the vehicle exhaust ignited material underneath the vehicle.
- The Fire was partially shielded by the vehicle.
- The Fire was sensed early by the flame detection.
- The system opens and the fire was extinguished at an early stage.
- The Fire Brigade attended from the monitoring system alert, but no intervention was required as the fire was extinguished.

Designed to Work

- Both the fire scenarios that occurred on this site had been discussed in early planning meetings.

- It proves that **all parties** should be brought to the table in planning a site suppression system.

- This includes the site operatives that are not always management decision makers, but are usually the eyes and ears of the operation, and most often the ones to see potential hazards and risks.

In Summary

- ✓ A significant risk was identified within a crucial part of a processing facility situated within a built up Industrial area. There was a real possibility of major and potentially widespread business interruption.
- ✓ A low pressure watermist system was identified as appropriate for protecting the hazards to lower the risks.
- ✓ The low pressure watermist system was installed.
- ✓ The site has had 2 fires in this area.
- ✓ Both were successfully dealt with at the earliest stages with only a short localized interruption.

Thank you for your attention

Presented by Dean Reeve – UK Operations

Special thanks to Xcell Misting Ltd. for allowing us to use their material.

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