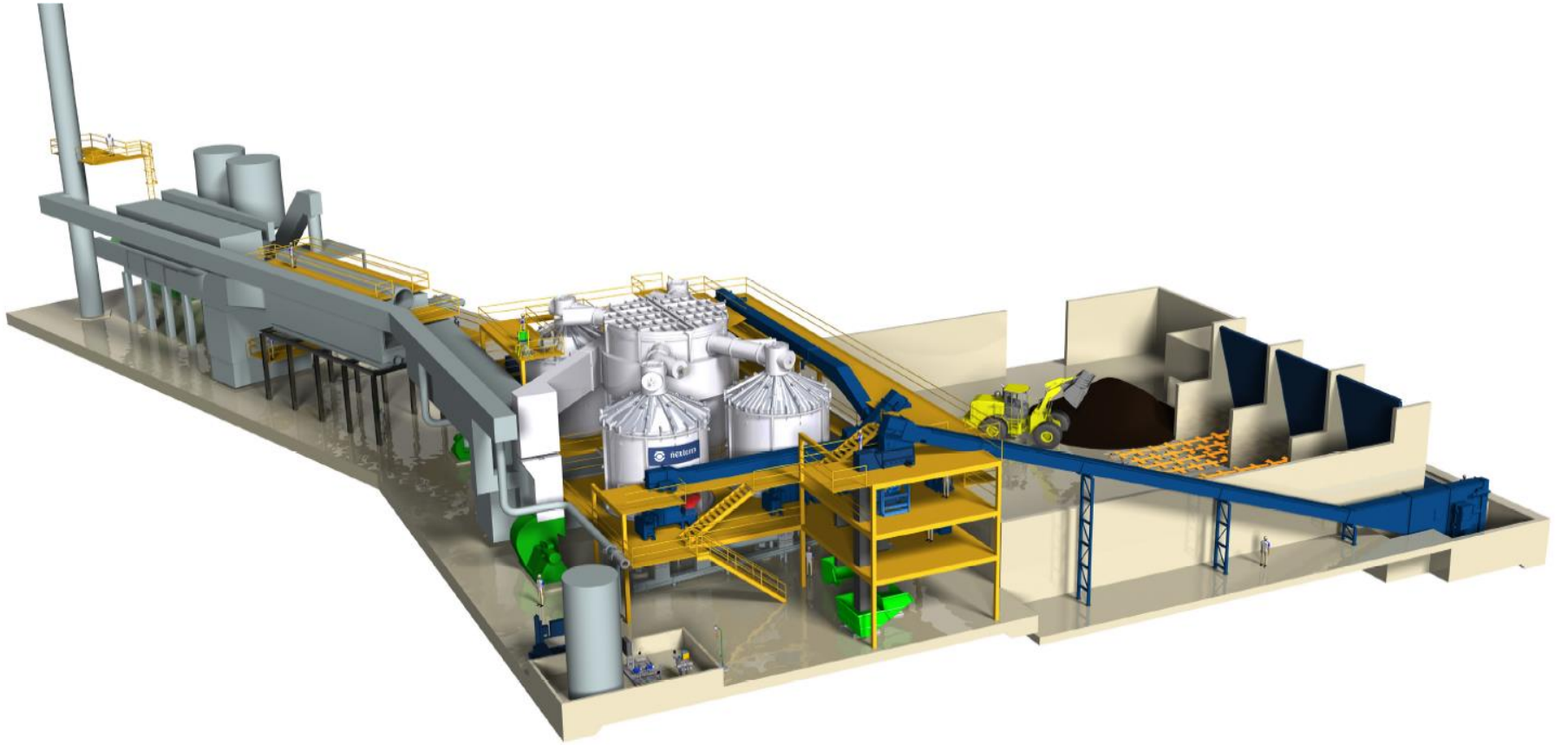


UK Water Mist Seminar 2017

Gary Howe EngTech FIFireE MIFPO
Senior Fire Protection Engineer
Zurich Risk Engineering UK

Water Mist Case Study – Bio Mass Waste to Energy





Fire Protection – Specialist Support

Concept to completion of project



Specialist knowledge of systems, standards and industry best practices, for your project to attain the most suitable level of protection for property insurance purposes.

Fire Protection Project Concept Review

A preliminary review of a proposed facility / occupancy, conducted at an early stage in the project.

Fire Protection Specification Review

A review of a proposed fire protection design (e.g. sprinklers, fixed fire protection, water supply, fire detection)

Fire Protection Plan Review

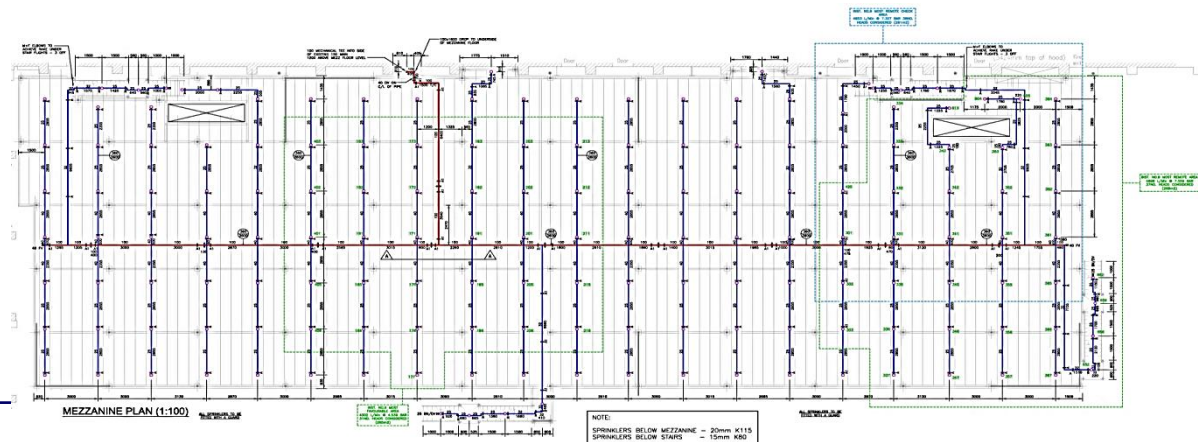
A detailed review of plans (e.g. sprinkler drawings, hydraulic calculations etc.)

Fire Protection Systems Installation – On-site Assessment

A site visit by ZRE at one or more stages during the installation of the fire protection systems to identify deviations from the specification

Fire Protection Acceptance Tests

Witnessing fire protection acceptance testing on-site.



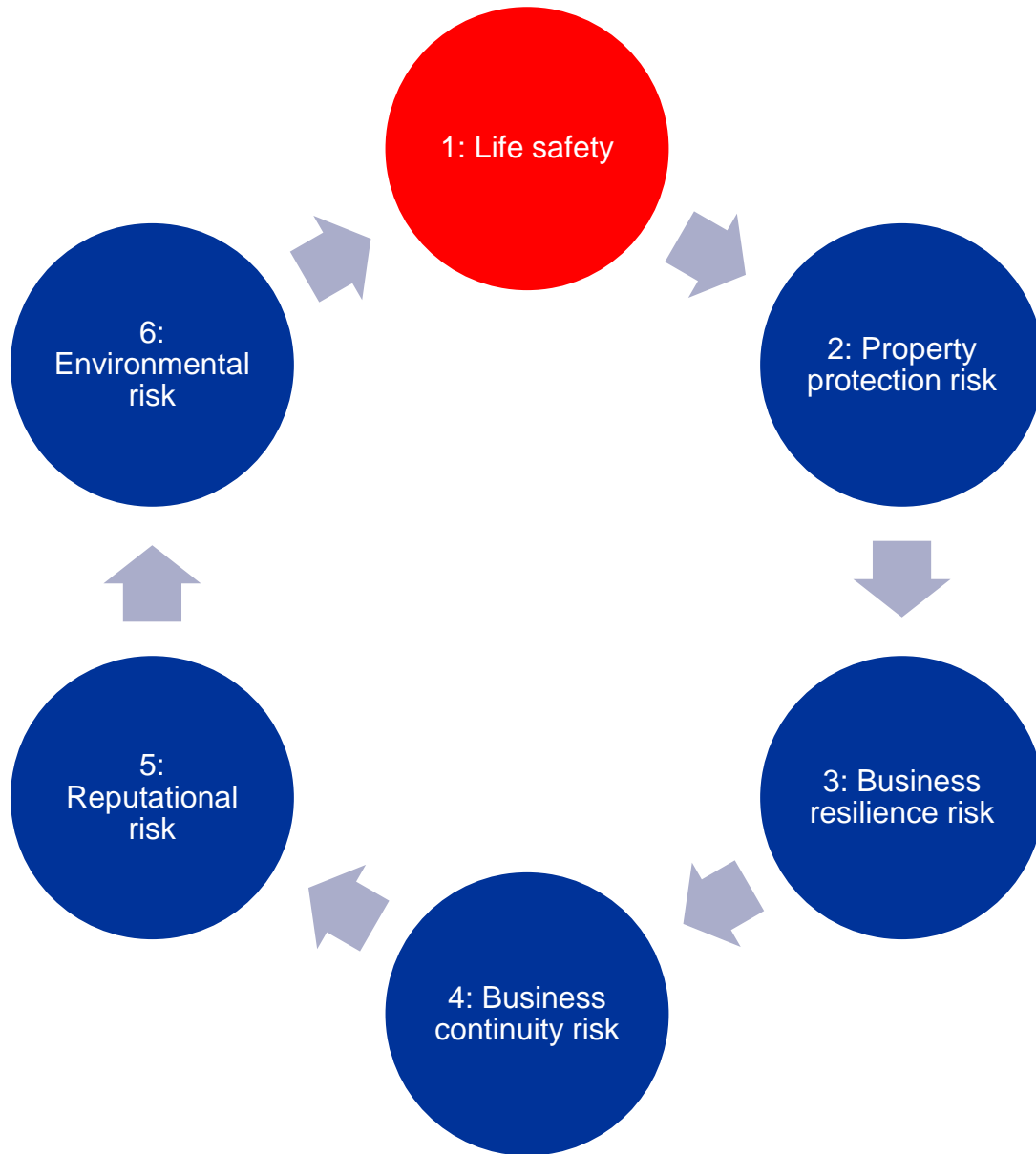
Assessing the risk

Is it
designed
right?

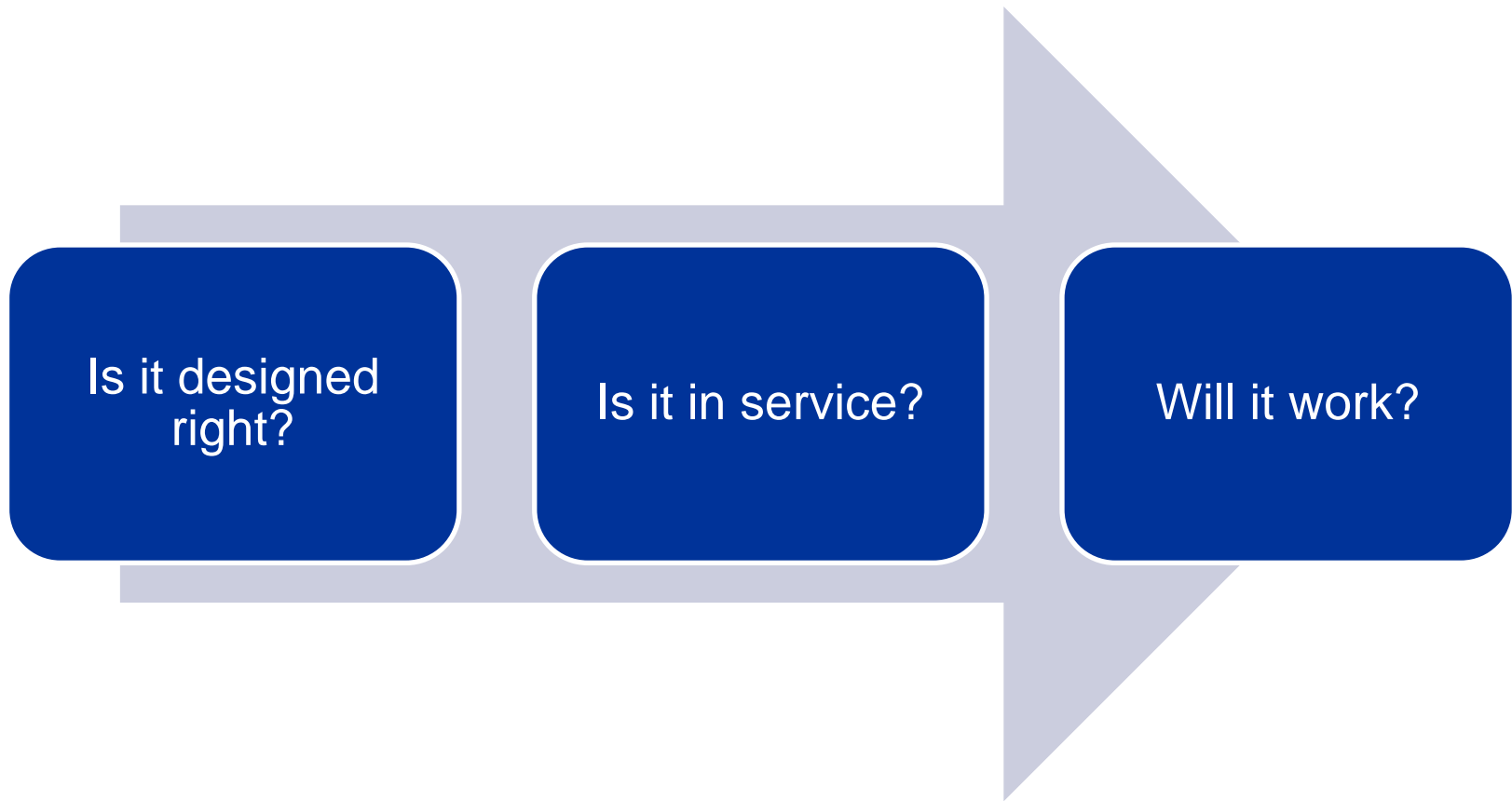
Is it in
service?

Will it
work?





- Basic approach to any fire protection or detection system:



Successful fire tests and performance to agreed and independent test protocol

Verification of hydraulic calculations, cause and effect matrix, system design, installation, commissioning, acceptance and maintenance documentation

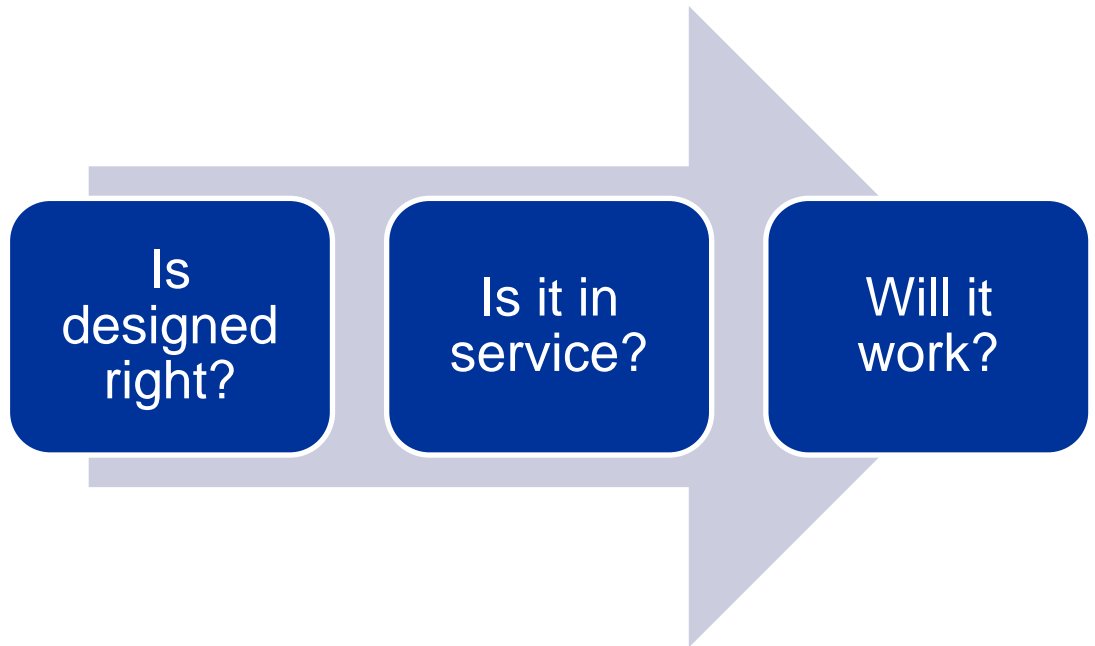
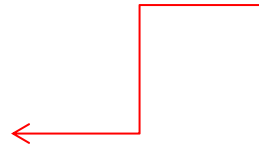
Insurance acceptability

Operational requirements including dedicated low voltage power supply, integrity and route of water supply, battery back-up and periodic flow test facility

Nozzles, equipment , components and infrastructure that are listed, approved, or certified by a recognised testing laboratory that have been subject to robust examination & performance testing

Fixed fire protection – Water Mist

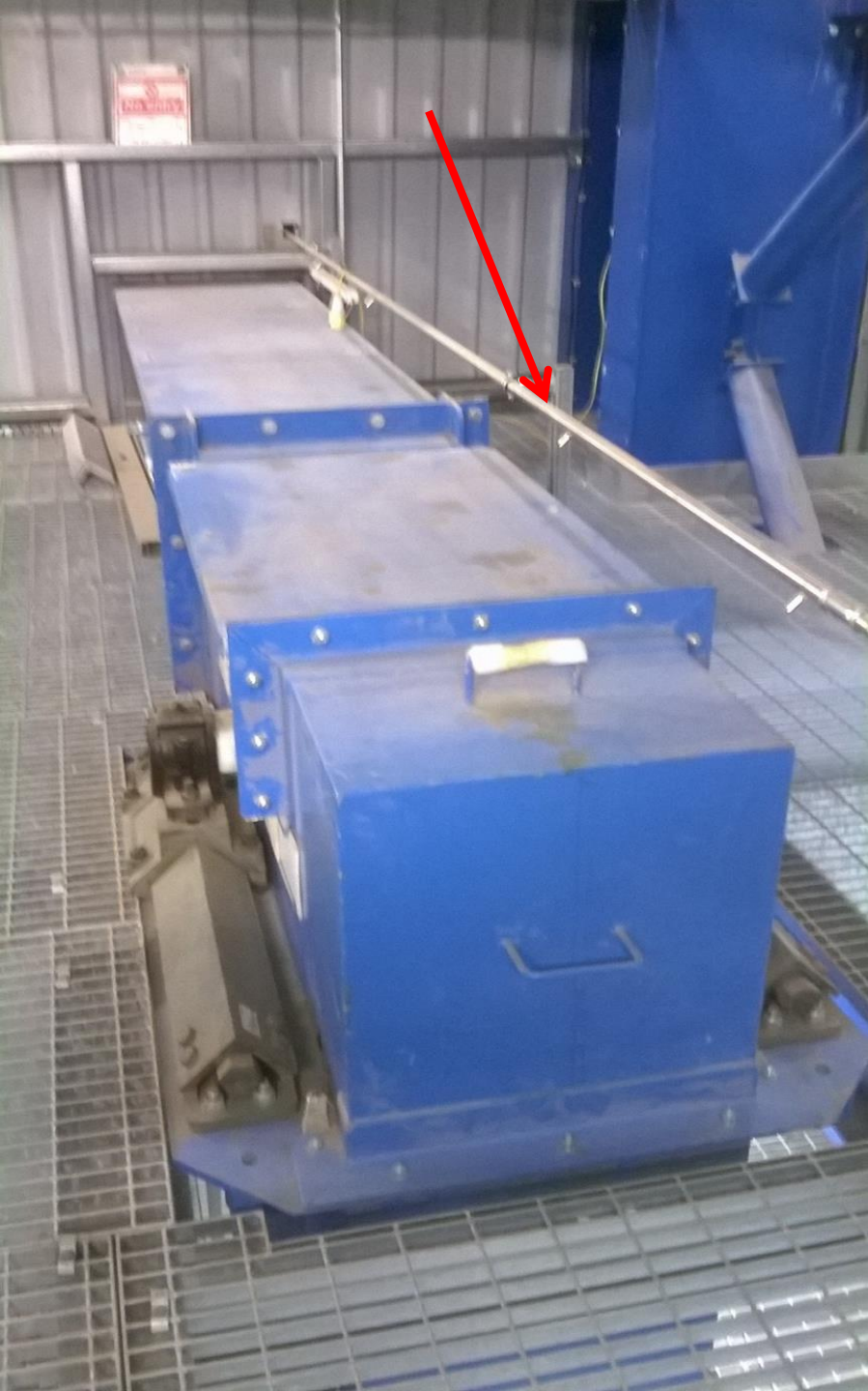
- Reception hall
- Conveyors
- Turbine
- External transformer
- Bag filters
- Propane tank farm
- Electrical switch rooms
- Server rooms
- HV/LV rooms



Challenges for Zurich on this project

- Water supply
- Assumed maximum area of operation (AMAO)
- Plant isolations/shut downs
- Conveyor system
- Infra red flame detection
- Thermal imaging cameras
- Value engineering
- Witness and functional testing
- Protection of turbine hall
- Reception hall - 32 Euro pallet fire test







Turbine hall

- Protection of very high value assets
- Long replacement times
- Critical plant



APPROVED

Certificate of Compliance

This certificate is issued for the following:

System Designation:	Model K6 Fine Water Spray System
System Type:	Water mist system for the protection of machinery and combustion or steam turbines in enclosures up to 162,801 ft3 (4610 m3) and 39.4 ft (12.0 m) in height
Design, Installation, Operation, and Maintenance Manual:	The water mist system is only Approved when installed in accordance with the VID Fire-Kill Model K6 Fine Water Spray System Design, Installation and Maintenance Manual, Doc No 110629-01-02, v.2, dated 15-Aug-2011, and in accordance with FM Global Property Loss Prevention Datasheets.

Prepared for:

VID FIRE-KILL
 SVALBARDVEJ 13
 DK-5700 SVENDBORG
 DENMARK

Manufactured at:

VID FIRE-KILL
 SVALBARDVEJ 13
 DK-5700 SVENDBORG
 DENMARK

FM Approvals Class: 5560

Approval Identification: 3040609 Approval Granted: September 9, 2011

Said Approval is subject to satisfactory field performance, continuing follow-up Facilities and Procedures Audits, and strict conformity to the constructions as shown in the Approval Guide, an online resource of FM Approvals.

For more than 160 years FM Approvals has partnered with business and industry to reduce property losses.



Member of the FM Global Group

Richard B. Dunne
 Group Manager – Fire Protection
 FM Approvals
 1151 Boston-Providence Turnpike
 Norwood, MA 02062

Reception hall

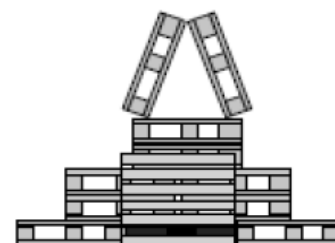
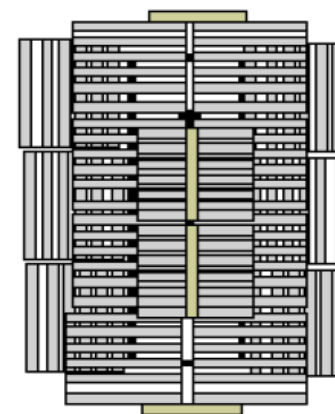
- Surface spread of flame
- Disturbed fire
- Deep seated fire
- Area 476^{m2}





Side pallet set-up

Two vertical pallets are positioned, one on each end of the center pallet set-up to form the final pallet set-up consisting of a total of 32 wooden euro pallets, and a 1m x 3m heptane pool.



Side pallet set-up

A.1.4 Test protocol

A.1.4.1 General

The tests with the water mist system shall be conducted at maximum ceiling and system installation height, maximum spacing and minimum discharge condition. The system shall be installed in accordance with the manufacturer's DIOM manual.

A.1.4.1.1 Watermist system test

The tested system shall be a zoned deluge system with a configuration of open nozzles all intended to be operated in case of fire. The system nozzle layout and total zone coverage used in the test will determine the minimum zone size for the deluge system. The system shall after manually activation be able maintain the minimum operating pressure and flow.

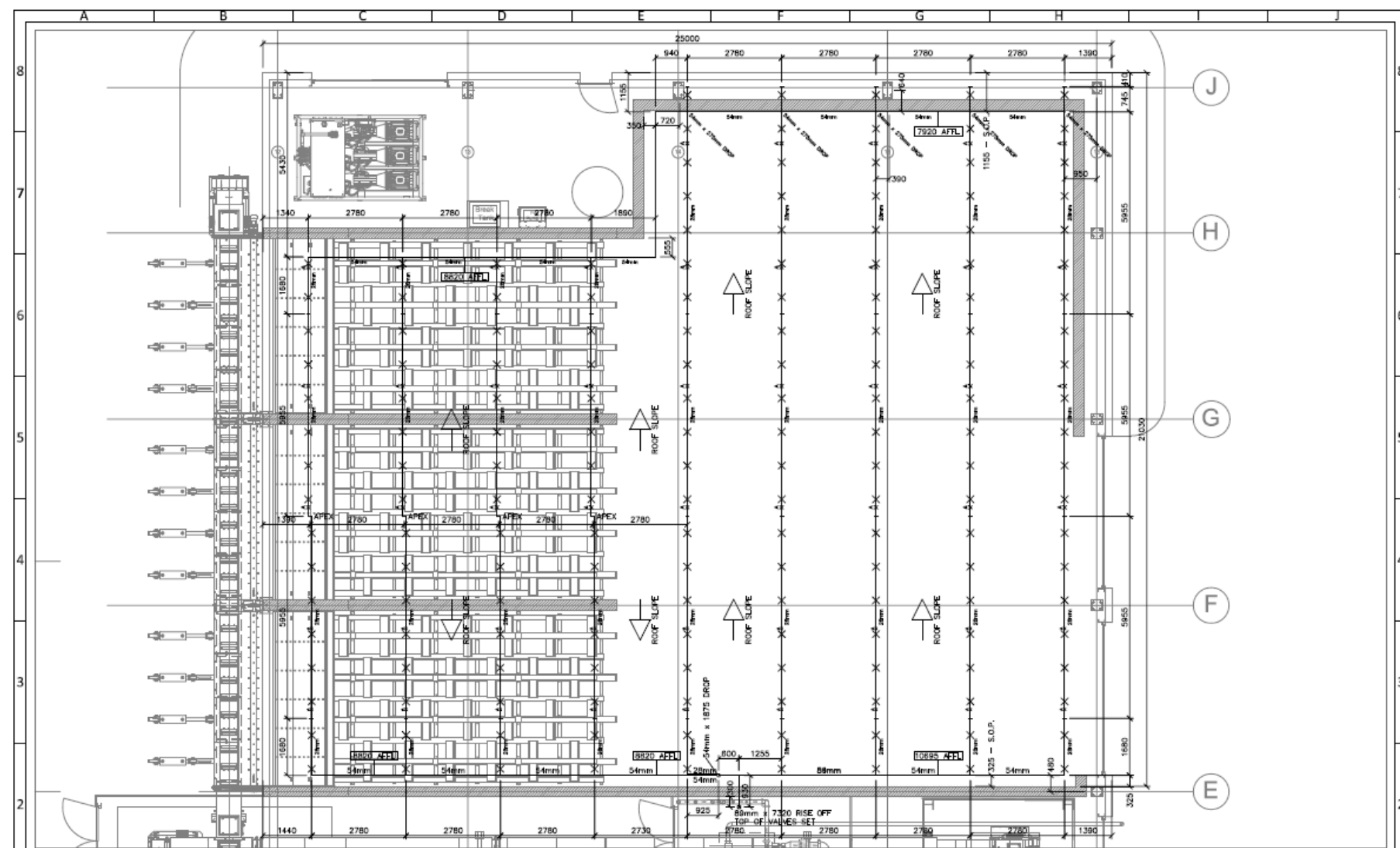












Symbol	Description
○	Lightning rod
○	Roofing beam
○	Head of beam
○	Head on top and side
○	Head on end
○	Roof panel head
○	Roof panel tail
○	Open head
○	Roofing beam

Material	Code	Quantity	Unit	Volume	Weight	Value
Aluminum	ALU	1.00	m ²	1.00	2.70	2.70
Steel	STE	1.00	m ²	1.00	7.85	7.85

Material	Code	Quantity	Unit	Volume	Weight	Value
Aluminum	ALU	1.00	m ²	1.00	2.70	2.70
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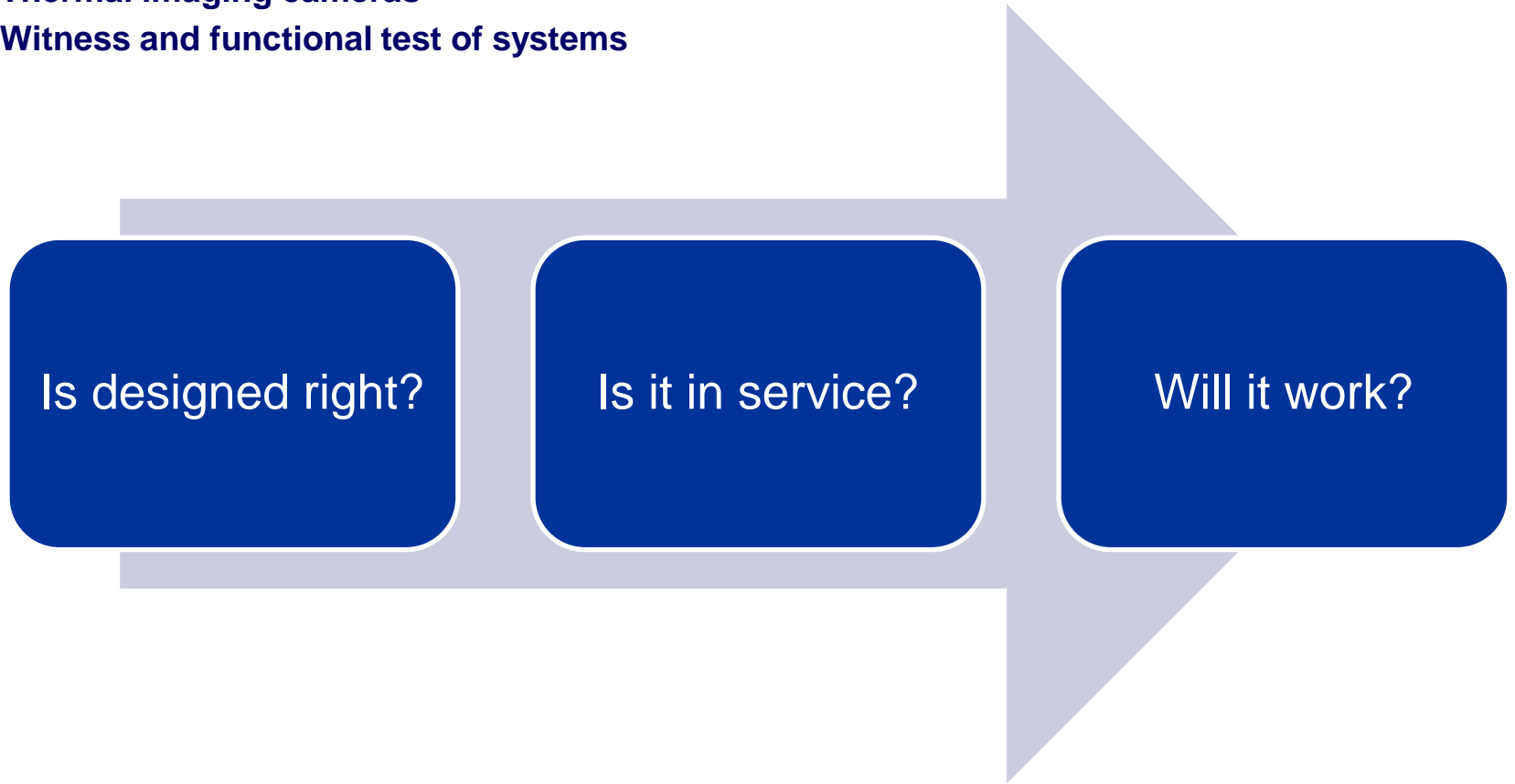
Material	Code	Quantity	Unit	Volume	Weight	Value
Aluminum	ALU	1.00	m ²	1.00	2.70	2.70
Steel	STE	1.00	m ²	1.00	7.85	7.85





Challenges overcome by Zurich

1. 90 min water supply
2. Assumed maximum area of operation (AMAO) – full deluge – 476m²
3. Plant isolations/shut downs
4. Full conveyor protection
5. Conveyor heat detection
6. Thermal imaging cameras
7. Witness and functional test of systems



Successful fire tests and performance to agreed and independent test protocol

Verification of hydraulic calculations, cause and effect matrix, system design, installation, commissioning, acceptance and maintenance documentation

Insurance acceptability

Operational requirements including dedicated low voltage power supply, integrity and route of water supply, battery back-up and periodic flow test facility

Nozzles, equipment , components and infrastructure that are listed, approved, or certified by a recognised testing laboratory that have been subject to robust examination & performance testing

In summary

- Good example of partnerships between Zurich Risk Engineering and Contractors.
- As an insurer where proven we can accept water mist for a number of specific applications and where proven by suitable and realistic fire tests that reflect the risk to be protected. Only then can a water mist system act effectively as intended
- It's apparent that not all water mist systems are considered equal!
- NFPA750 – 'Reliance is placed on the procurement and installation of listed water mist equipment or systems that have demonstrated performance in fire tests as part of a listing process.

Any questions?

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