



## Case Studies Pack

### Dry Riser Experience & Case Studies

Inspection, Testing, Remedial Works & Non-Standard Systems

Demonstrating professional competence in dry riser systems across residential, healthcare, heritage, aviation, and high-risk environments.

#### Fire Knight Ltd

Specialist Dry Riser Inspection & Maintenance

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# Case Study 1 - Remedial Works - High-Security Aviation Facility

## Project Type:

High-security aviation support facility within a major international airport environment

## Client Type:

Global facilities management contractor operating across critical UK infrastructure

## Role:

Dry riser remedial works and system upgrade

(Works carried out by the Director while employed by a national fire protection contractor)

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## System Overview

- Large operational building within a live airport environment
  - 28 dry riser landing valves to be replaced
  - Original installation: threaded landing valves
  - Restricted-access, high-security site with permit-controlled works
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## Scope of Works

- Removal of all existing threaded landing valves
  - Installation of flange adapters and PN16 flanged landing valves
  - Full pressure testing and functional verification
  - Liaison with facilities management throughout the works
  - Completion under live site conditions
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## Technical Challenge

The existing landing valves had been in service for a significant period and had become increasingly stiff and difficult to operate, presenting operability and maintenance concerns. Replacement had been recommended during routine inspections for approximately three years prior to approval.

Due to the age of the installation, valve removal proved challenging, requiring controlled techniques to avoid damage to the existing riser pipework.

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## **Risk Management & Controls**

- Works carried out by a two-engineer team
  - Controlled pressurisation and valve replacement procedures
  - Compliance with site security, permits, and access requirements
  - Ongoing communication with the FM client during all phases
  - Phased approach to minimise system downtime
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## **Engineering Solution**

Rather than a like-for-like replacement, the system was upgraded by:

- Installing flanged adapters and fitting PN16 flanged landing valves

This solution was selected to improve long-term maintainability and simplify future replacement works.

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## **Testing & Compliance**

- System pressure tested following completion
  - All landing valves verified for correct operation and dry risers returned to full condition
  - Site left fully compliant with BS 9990
  - Certification and documentation issued
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## **Outcome**

- All 28 landing valves successfully replaced
  - System restored to full operational condition
  - Improved reliability and ease of future maintenance
  - Reduced long-term risk to life safety systems
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## **Key Competencies Demonstrated**

- Large-scale dry riser remedial works
- Working within live, high-security airport environments
- Long-term defect identification and management
- Practical engineering judgement and system improvement
- Professional communication with major FM contractors

# Case Study 2 - Dry Riser Service - Remote Heritage Site with Non-Standard Water Supply

## Project Type:

Historic heritage site operated by National Trust, located on elevated ground with remote access

## Client Type:

Heritage property operator / estate management

## Role:

Dry riser inspection, pressure testing, and system management under non-standard conditions (Works carried out by the Director while employed by a national fire protection contractor)

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## System Overview

- Dry riser main: 8-inch diameter pipework
  - Approximate length: 250 metres
  - Pipe route: Underground run from the base of a hill to a historic structure at elevated level
  - Site characteristics:
    - Remote location
    - No on-site fire hydrant
    - Limited vehicle access
    - Live heritage environment
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## Scope of Works

- Preparation and pressure testing of an unusually large dry riser system
  - Provision of temporary water supply for testing purposes
  - System pressure test in accordance with BS 9990
  - Controlled depressurisation and post-test system condition management
  - Liaison with site representatives and local fire brigade requirements
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## Technical Challenge

The site had no fire hydrant or suitable permanent water supply to facilitate standard dry riser pressure testing. Additionally, the length and diameter of the pipework meant:

- A very high water volume was required
- Draining and refilling the system would be time-consuming
- Complete drainage following testing could compromise emergency readiness

A non-standard approach was therefore required to safely test the system while maintaining operational readiness.

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## Engineering Solution

To overcome the lack of hydrant access:

- A centrifugal suction pump was hired and deployed
- Water was drawn from a lake at the base of the hill
- The pump was operated continuously throughout the test
- A temporary water tank was maintained and kept topped up using lake water to ensure consistent test pressure

This approach allowed the system to be fully pressure tested despite the remote location and lack of infrastructure.

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## Risk Management & Controls

- Controlled pump operation to maintain stable test pressure
  - Continuous monitoring of water levels and pump performance
  - Environmental considerations when abstracting water
  - Clear communication between engineers during pressurisation
  - Adherence to site access and heritage protection requirements
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## Testing & Post-Test Management

- System successfully pressure tested in line with BS 9990
- Following testing, pressure was partially released rather than fully drained
- At the request of the local fire brigade, the system was:
  - Left full of water
  - Maintained in a ready state due to the size and fill time of the installation

This ensured the system could be used immediately in an emergency without lengthy refill delays.

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## Outcome

- Full pressure test completed successfully despite non-standard conditions
  - Dry riser system left operational and emergency-ready
  - Fire brigade requirements satisfied
  - Client provided with clear explanation of system condition and rationale
  - Demonstrated safe, practical problem-solving in a challenging environment
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## Key Competencies Demonstrated

- Dry riser testing in remote and infrastructure-limited locations
- Management of large-diameter, long-run pipework
- Use of temporary pumping and water supply solutions
- Liaison with fire authorities and site stakeholders
- Practical engineering judgement beyond routine servicing

# Case Study 3 - Dry Riser System Modification Support - Live Hospital Environment

## Project Type:

Large acute hospital site with multiple interconnected buildings

## Client Type:

Healthcare estate management / construction contractor working within a live hospital

## Role:

Dry riser system isolation, drainage, recharge, and commissioning support

(Works carried out by the Director while employed by a national fire protection contractor)

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## System Overview

- Dry riser system configured as a large horizontal ring main
  - Pipework routed around the hospital estate rather than a traditional vertical riser
  - System normally maintained full of water due to size and refill time
  - Live hospital environment requiring continuous fire safety consideration
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## Scope of Works

- Planned isolation and controlled drainage of the dry riser system
  - Cooperation with a construction contractor installing new pipework to serve a newly added building
  - Technical support during system modification works
  - Careful monitoring and inspection of new pipework during re-pressurisation
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## Technical Challenge

Due to the size and configuration of the dry riser ring main, the system is kept charged with water, as fully draining and refilling would be time-consuming and could impact fire readiness.

The works required:

- Temporary manual drainage of a life-safety system at various points
  - Close coordination with construction activities
  - Careful control of recharging to prevent leaks or failures
  - Continuous awareness of the live hospital environment
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### **Risk Management & Controls**

- Planned system isolation coordinated with site management
  - Clear communication with the construction contractor throughout
  - Slow, staged recharging of the system
  - Continuous inspection of the newly installed pipework section
  - Immediate readiness to halt pressurisation if defects were identified
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### **System Recharge & Verification**

- The dry riser was slowly recharged in a controlled manner
  - The new section of pipework was continuously checked for leaks and joint integrity
  - No leaks or defects were identified during re-pressurisation
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### **Outcome**

- Successful integration of a new building into the existing dry riser system
  - Dry riser returned to full operational condition
  - Fire safety provision maintained throughout the works
  - Construction contractor supported with specialist system knowledge
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### **Key Competencies Demonstrated**

- Dry riser work within live hospital environments
- Understanding of non-standard horizontal ring main systems
- Coordination with construction and estate teams
- Controlled drainage and recharging of large systems
- Risk-aware working on critical life safety installations

# Case Study 4 - Critical Dry Riser Inlet Valve Non-Compliance Identified

**Project Type:**

New-build residential apartment block

**Client Type:**

Residential developer / managing agent

**Role:**

Dry riser inspection, compliance assessment, remedial works, and pressure testing  
(Works carried out by the Director while employed by a national fire protection contractor)

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**System Overview**

- Newly installed dry riser system
  - System presented for initial inspection and pressure testing
  - Incorrect inlet arrangement installed during construction phase
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**Scope of Attendance**

- Detailed pre-test inspection of the dry riser system
  - Assessment of inlet configuration prior to pressurisation
  - Identification of compliance and safety issues
  - Immediate reporting of findings to the responsible party
  - Quotation for remedial works
  - Reattendance to complete corrective works and complete testing
- 

**Non-Compliance Identified**

During the pre-test inspection, it was identified that:

- A landing valve had been installed to be used as the dry riser inlet
- No compliant inlet valve arrangement was present

- No suitable drain provision was incorporated into the inlet assembly

This configuration was non-compliant and presented a significant safety risk, as the system could not be safely drained or managed without a correct inlet and drain valve arrangement.

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### **Professional Decision & Risk Management**

Due to the nature of the non-compliance:

- The decision was taken to refuse to pressure test the system
- Proceeding with testing would have been unsafe and contrary to accepted standards and best practice
- The issue was clearly documented and fed back to the relevant responsible person

This ensured the system was not pressurised in an unsafe condition.

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### **Corrective Action**

A remedial solution was proposed and accepted, which included:

- Removal of the incorrectly installed landing valve
  - Installation of a 100mm flanged adapter
  - Installation of a compliant flanged dry riser inlet valve
  - Provision of a correct inlet arrangement suitable for safe testing, operation, and drainage
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### **Testing & Compliance**

Following completion of the remedial works:

- The dry riser system was pressure tested
  - The system was confirmed to be compliant and safe for service
  - Appropriate documentation and certification were issued
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## **Outcome**

- Critical non-compliance identified before unsafe testing took place
  - System installation corrected to meet required standards
  - Dry riser successfully tested and commissioned
  - System left fully compliant and safe for use
  - Client provided with clear explanation and resolution pathway
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## **Key Competencies Demonstrated**

- Detailed pre-test inspection and defect identification
- Understanding of compliant inlet and drainage arrangements
- Willingness to halt works where safety is compromised
- Clear communication of technical non-compliance
- Delivery of compliant remedial solutions
- Professional judgement on life-safety systems

# Case Study 5 - Air Release Valve Non-Compliance Identified

## Project Type:

Residential apartment block

## Client Type:

Building management

## Role:

Dry riser inspection, compliance assessment, remedial works, and pressure testing  
(Works carried out by the Director while employed by a national fire protection contractor)

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## Scope of Attendance

- Detailed pre-test inspection of the dry riser system
  - Assessment of termination arrangements prior to pressurisation
  - Identification of compliance and operational issues
  - Liaison with building management
  - On-site remedial works and completion of pressure testing
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## Non-Compliance Identified

During the pre-test inspection, it was identified that:

- **No air release valves were installed** at the high points of the system
- Termination points had been incorrectly fitted with **screwed caps** instead
- This arrangement was **non-compliant** and unsuitable for safe operation

Without air release valves, trapped air would be unable to escape during filling, causing resistance to water flow, inaccurate pressurisation and increased risk during system operation or testing.

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## Professional Decision & Corrective Action

Given the identified risk, pressure testing was not commenced.

The issue was clearly explained to the building manager - including why air release valves are required, and the safety and operational implications of the existing arrangement.

Approval was obtained to proceed with immediate corrective works:

- Removal of screwed caps at termination points
- Installation of compliant air release valves

All remedial works were completed during the same site attendance.

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### **Testing & Compliance**

Following installation of the air release valves:

- The system was safely filled and pressure tested
  - Air was correctly expelled from the system
  - System operation was verified as satisfactory
  - Documentation and certification were completed
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### **Outcome**

- Critical non-compliance identified prior to unsafe testing
  - System corrected to allow safe filling and operation
  - Pressure testing completed successfully
  - System left fully compliant and operational
  - Building management fully informed of the issue and resolution
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### **Key Competencies Demonstrated**

- Detailed inspection and identification of hidden non-compliances
- Understanding of dry riser system hydraulics and operation
- Willingness to halt unsafe works
- Clear technical communication with building management
- Rapid on-site resolution of compliance issues
- Safe commissioning of life-safety systems