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Secure Enterprise Integration for Research Reactors

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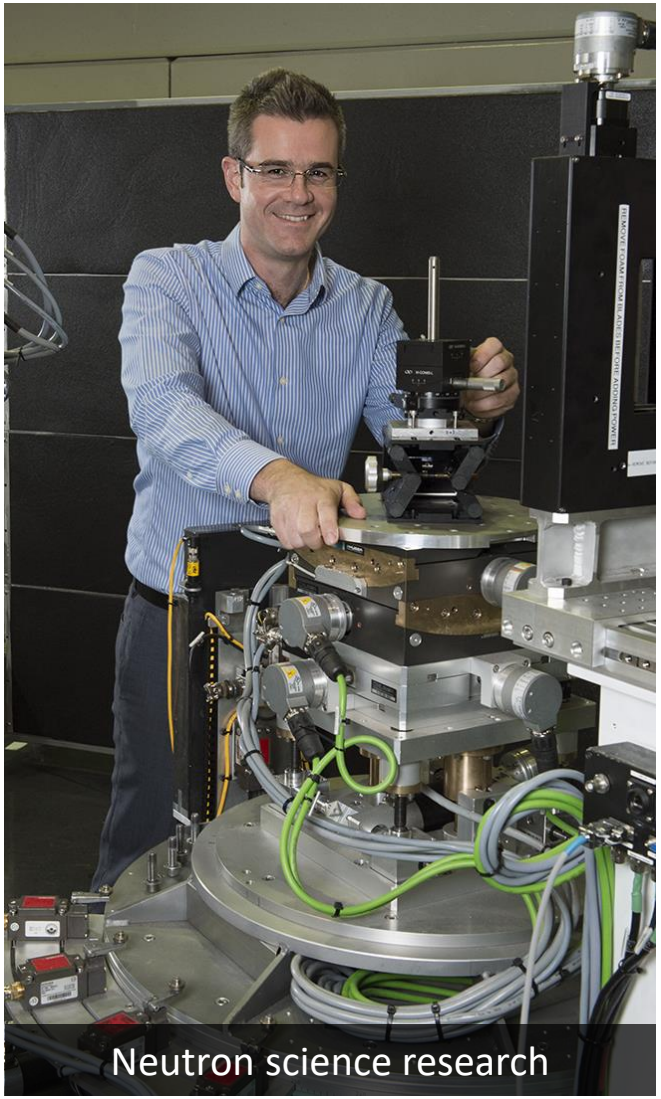
Overview

- OPAL
- Enterprise Integration Requirements
  - Neutron Beams
  - Manufacturing
  - Engineering, Operations, Maintenance
- Regulatory Requirements
- Legacy Data Flow Architecture
- Secure Enterprise Integration

OPAL – Multipurpose Reactor

Radioisotope production


Neutron science research


Silicon irradiation

OPAL

- Multipurpose
- Users want neutrons...

  And data…

  Safe, **Secure**, Sustainable

Integration Requirements
1. Neutron Beams

- Telemetry from plant systems used to provide neutron beams for the Australian Centre for Neutron Scattering (ACNS)

- ACNS uses the data in near real-time when performing experiments with the neutron beams

Integration Requirements
2. Manufacturing

- Scheduling data loaded into the reactor for manufacturing

- Data produced by the reactor during the course of manufacturing activities:
  - Timing data
  - Neutron Flux data
  - Other plant state data

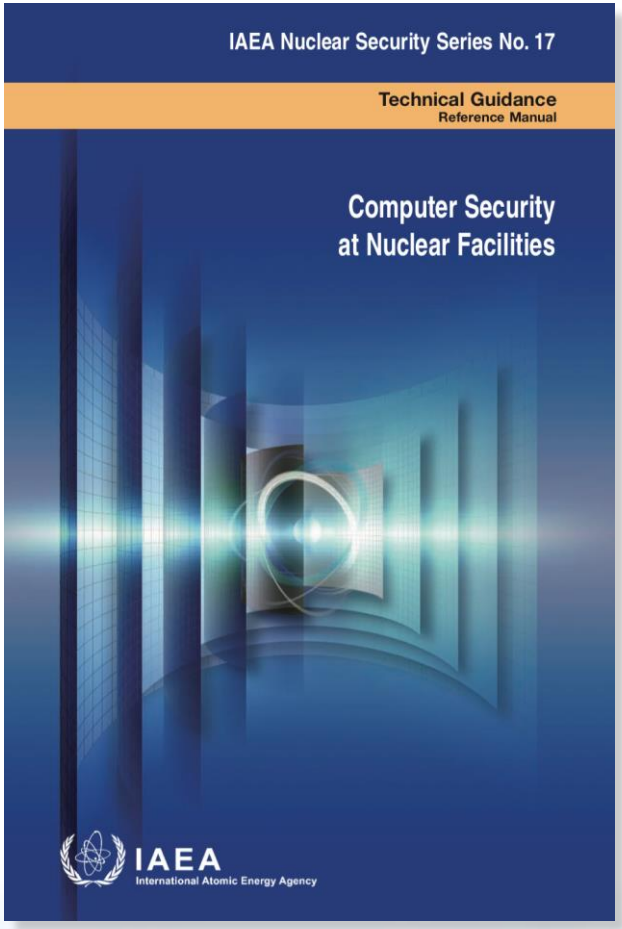
Integration Requirements
3. Engineering, Operations, Maintenance

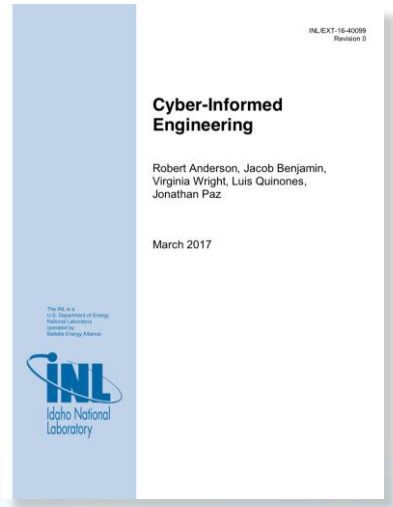
- Data collected by staff or produced by OT systems
- Data loaded into OT systems for engineering purposes

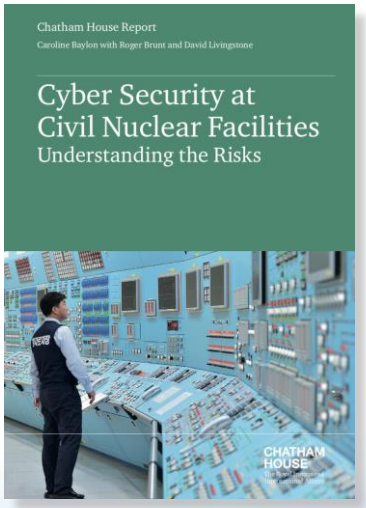
Data Type	Generation Method	Generation Frequency	Usage Requirements
Engineering, Operations, Maintenance	User generated	Daily or Weekly	Ad-hoc, non-real-time
Neutron Beam Line Telemetry	System generated	Multiple samples per minute	Automated real-time analysis
Manufacturing execution data	User and System generated	Hourly	Corporate ERP system, near real-time

Regulatory Requirements

...and other guidance





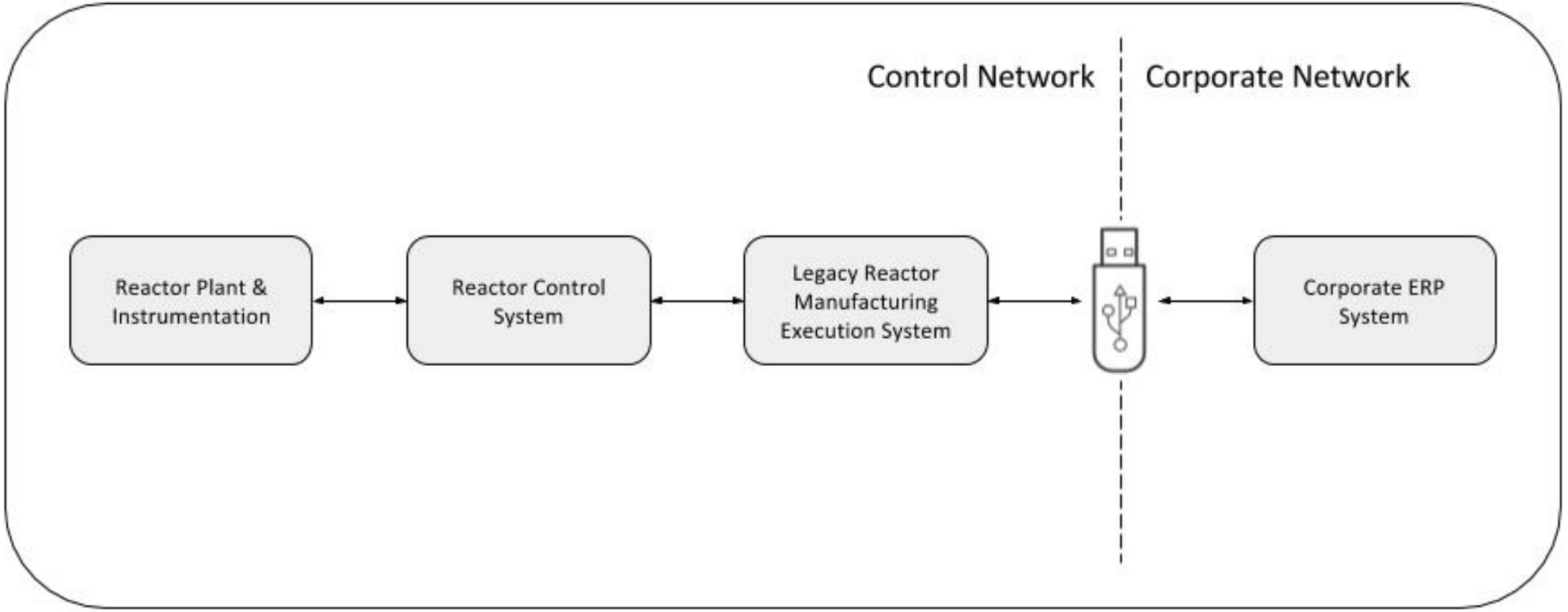


Regulatory Requirements

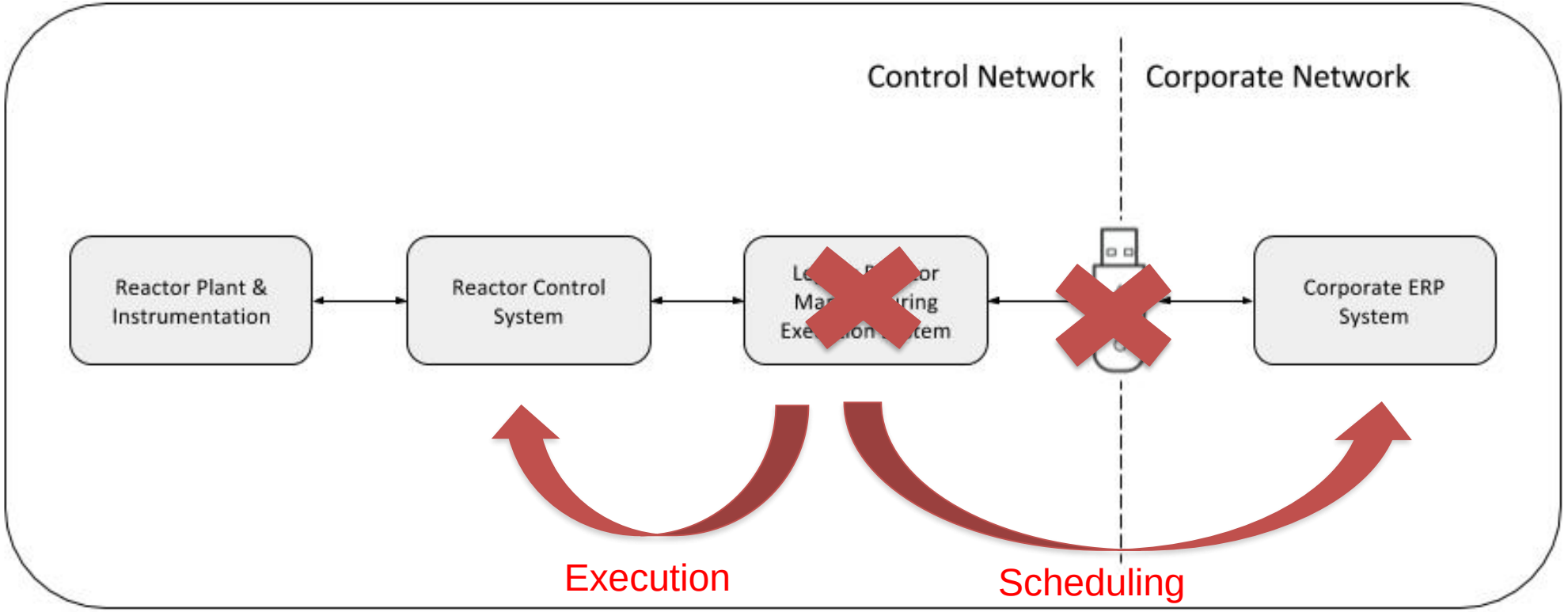
1. Cyber Security Risk Assessment

2. Cyber Security Engineering
   - Data Flows
   - System Architecture
   - Security Controls

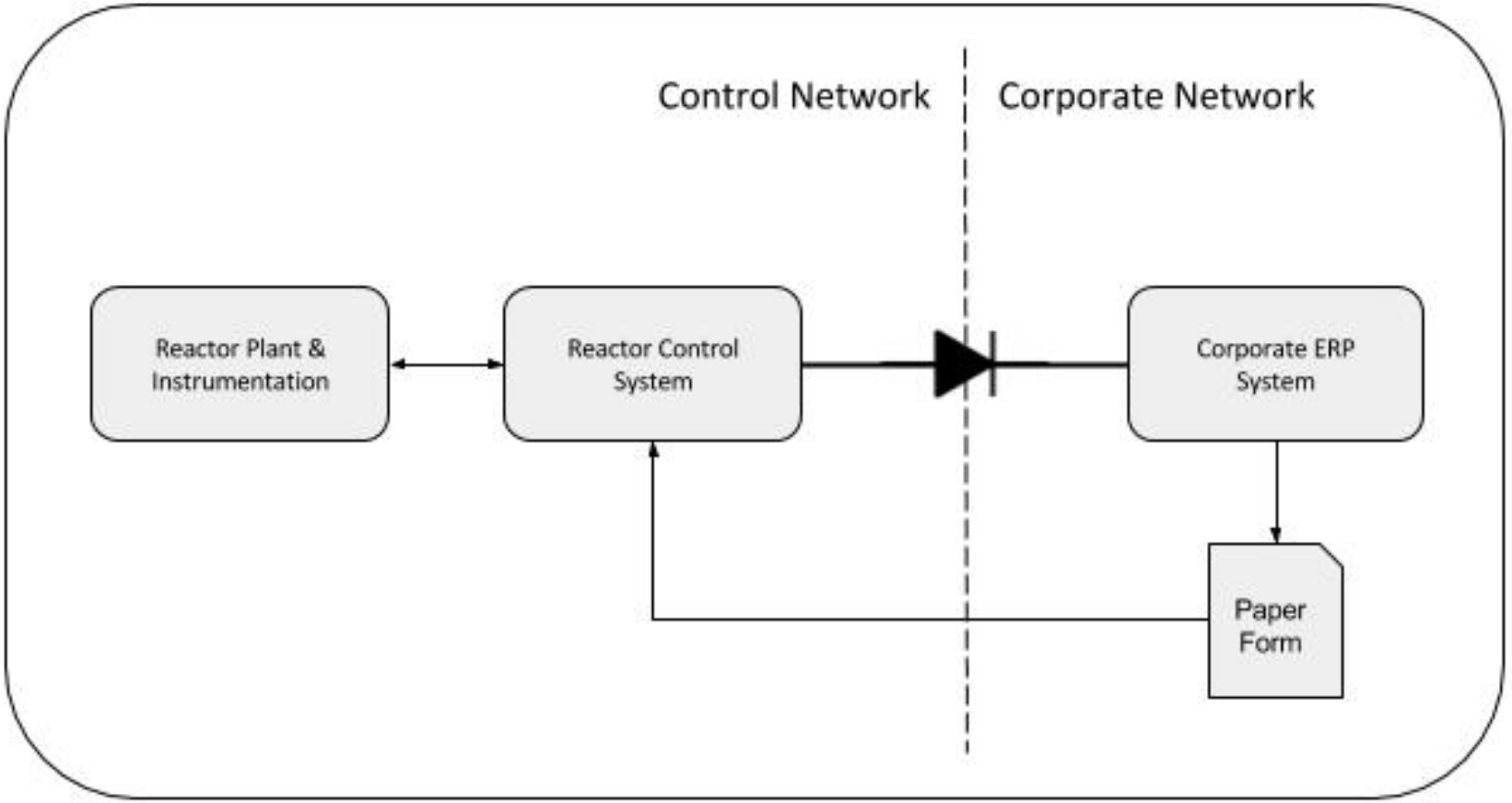
Legacy Data Flow Architecture



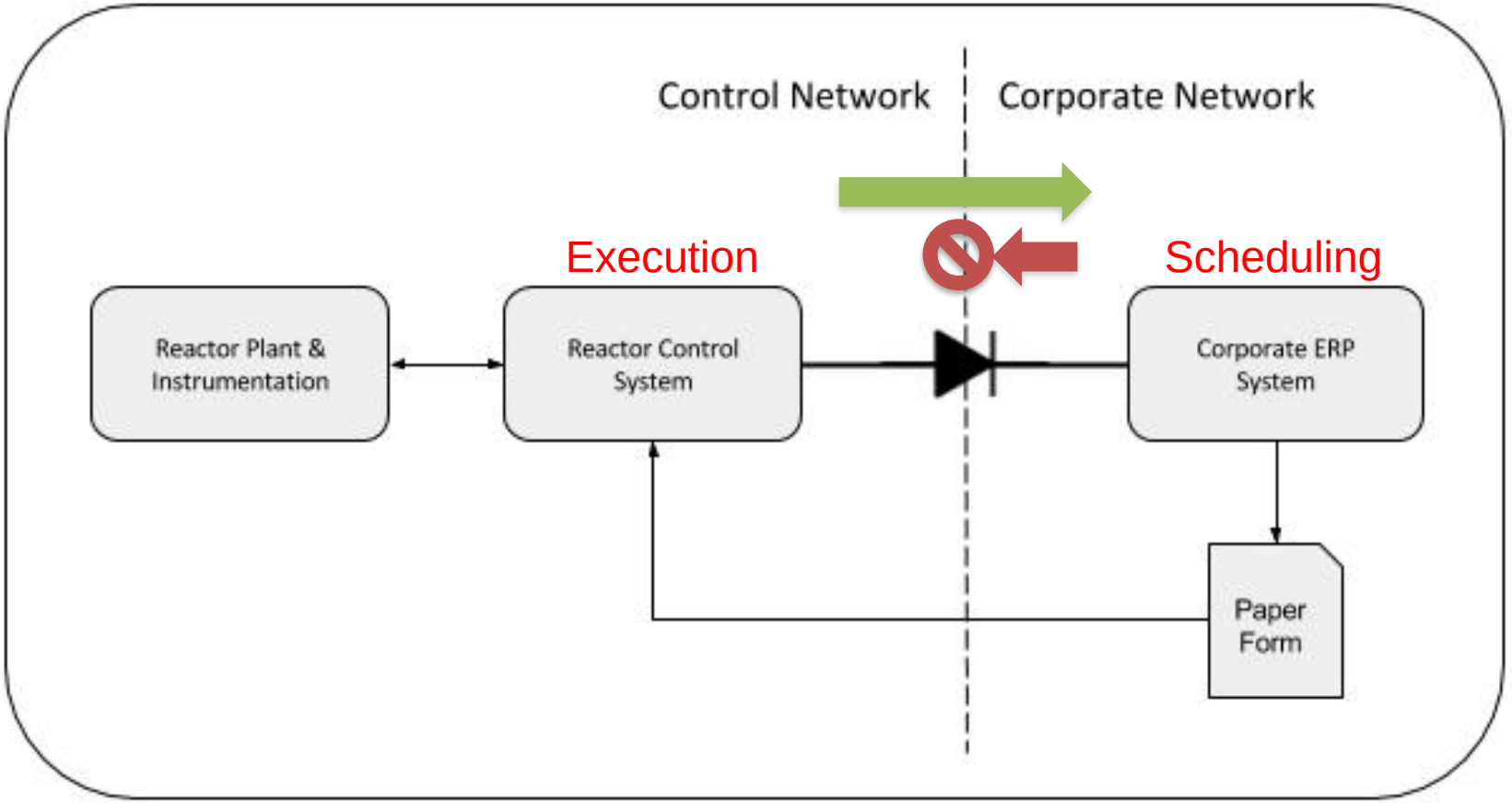
Legacy Data Flow Architecture



Secure Enterprise Integration



Secure Enterprise Integration



Summary

1. Minimise “information system” functionality from within the OT environment
    a. Maximise “engineering system” functionality within the OT environment

2. Use a Data Diode to transmit data from the OT to the IT (and physically block connectivity coming back)

3. Limit data entry to strictly controlled formats and media by specifically authorised staff

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