



A Control Room Demonstration Suite (CoRDS) to Assess the Control Room Management Requirements of Active Distribution Networks

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Overview

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- The development of a Control Room Demonstration Suite (CoRDS)
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Introduction



Supergen FlexNet consortium project

Project Objectives:

*To establish the **impacts** of distributed generation (DG) and active network management (ANM) schemes on the **control room operation and management** of distribution networks, and to use this information to facilitate control engineers in the transition to active distribution networks*

Managing Active Distribution Networks

ADNs will have:

- Various types and levels of DG connected at 33 and 11kV
- ANM controls and smart grid technologies deployed
- Automation schemes in operation
- Increased network congestion and communication traffic



Managing Active Distribution Networks

Control Room implications include:

- Bi-directional power flows
- SCADA alarm changes
- Decentralised control schemes
- All of which are *unfamiliar* to distribution networks and distribution control engineers



Operational Challenges

- Unfamiliar operating conditions
- Congested networks operating closer to their statutory limits
- Uncertainty regarding DG connection and ANM/automation deployment
- Uncertainty regarding the impacts of ADNs on wider control room procedures and requirements

A Control Room Demonstration Suite (CoRDS)

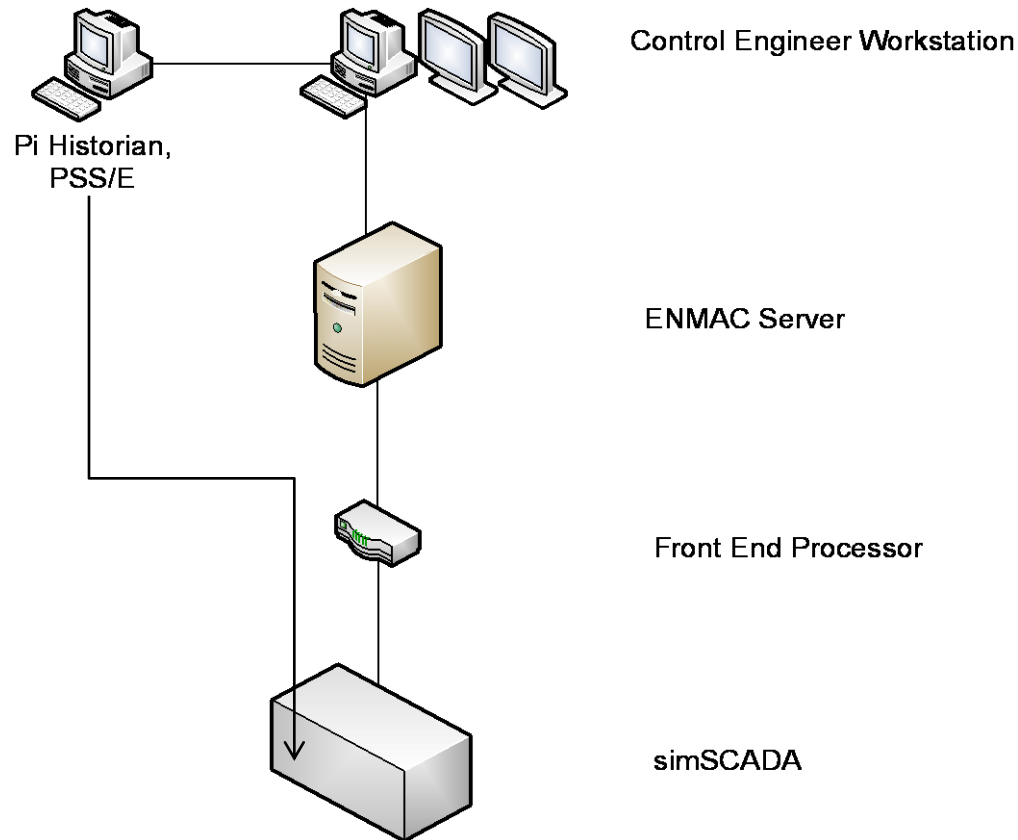
Objectives of the CoRDS

- To allow future ADNs to be simulated in a control room environment
- To assess the operational impacts of these networks in terms of
 - Technical requirements
 - Human (control engineer) requirements

CoRDS Investigations and Outcomes

	Investigation	Benefit(s)
A	To establish how ANM schemes are integrated into the control room and interfaced in the Distribution Management System (DMS)	This will allow a standard integration process to be developed which will facilitate the streamlining of ANM scheme deployment in control rooms
B	To assess the behaviour of ANM schemes in response to range of network events	This will give a clearer view of how ANM schemes will act and react in different situations
C	To assess the behaviour of ANM schemes as networks become 'busier' with higher penetrations of DG	This will allow ANM scheme performance to be tested under stress
D	To understand and quantify the level and nature of control engineer interactions with ANM schemes through changing network events and DG penetrations	This information will shed light on future control engineer staffing, training and work load requirements

CoRDS Technical Set-up



The CoRDS is being developed in collaboration with Scottish & Southern Energy using their offline tools and databases

CoRDS Test Conditions

Wish to test a range of scenarios:

1. High wind generation output and Low demand
2. Low wind generation output and High demand
3. Fault and outage conditions
4. ANM scheme outage conditions

Further Work

- Carry out the investigations described and assess the results (as well as assessing the value of the CoRDS itself)
- Install these demonstration capabilities at the University of Strathclyde
- To be used as a planning tool for distribution control rooms

Thank you