Public

Grid Code Development Forum

2 October 2024

NESO
National Energy System Operator

Agenda

1	Introduction, meeting objectives and review of previous actions - **Claire Newton, NESO**
2	Proposed Introduction of a Metering Polarity Standard to the Grid Code - **Joesph Harwood, NESO**
3	EDT Contingency Process update – **Stuart Brace, NESO**
4	Fax Machine Replacement Programme update**, Paul Bainbridge / Jim Hunt, NESO**
5	AOB and Meeting Close **Claire Newton, NESO**

GCDF – Objectives and Expectations

Objective
Develop ideas, understand impacts to industry and modification content discussion, in relation to Grid Code related issues.
Anyone can bring an agenda item (not just the NESO!)

Expectations
Explain acronyms and context of the update or change
Be respectful of each other’s opinions and polite when providing feedback and asking questions
Contribute to the discussion
Language and Conduct to be consistent with the values of equality and diversity
Keep to agreed scope

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Review of Previous Actions

ID	Month	Description	Owner	Notes	Target Date	Status

Power Flow Metering Polarity Issues and proposed solution

Grid Code Development Forum

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Power Flow Metering Polarity – Issue

- **Issue**
  - “Incorrect/inconsistent” polarity for power flow metering data fed into the NESO SCADA system, for example negative instead of positive flow

- **Impact for NESO**
  - Deteriorating accuracy in NESO management system
  - Reduced State Estimation reliability impacting situational awareness
  - Reduced system security and potential SQSS breach due to less effective contingency analysis
  - Additional balancing cost incurred by less efficient output from downstream NESO balancing and forecast system

- **Impact for other stakeholders**
  - Delay in setting up metering for new connections
  - Increased workload due to updating and correcting metering polarity
  - Delay in NESO’s decision making for outages and commissioning
  - Potential billing errors for settlements between NESO and energy providers

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Power Flow Metering Polarity – Current Status and Effort

- **Current Status**
  - No clear and unified power flow polarity standard in Grid Code for power flow data sent to NESO
  - No clauses in Grid Code or licence obligation requesting parties to follow a power flow polarity standard and parties may choose their own convention which is inconsistent with other parts of the network
  - No clauses in Grid Code requesting parties sending power flow metering with "incorrect" polarity to fix the issue

- **Current Effort**
  - NESO regularly audits, investigates and fix meters with incorrect polarity internally, but workaround fix is temporary and not sustainable
  - NESO tries to establish communication channel with relevant parties to investigate and resolve the issues
  - NESO has set up a working group aiming to seek solutions in terms of code, standard, policy and process

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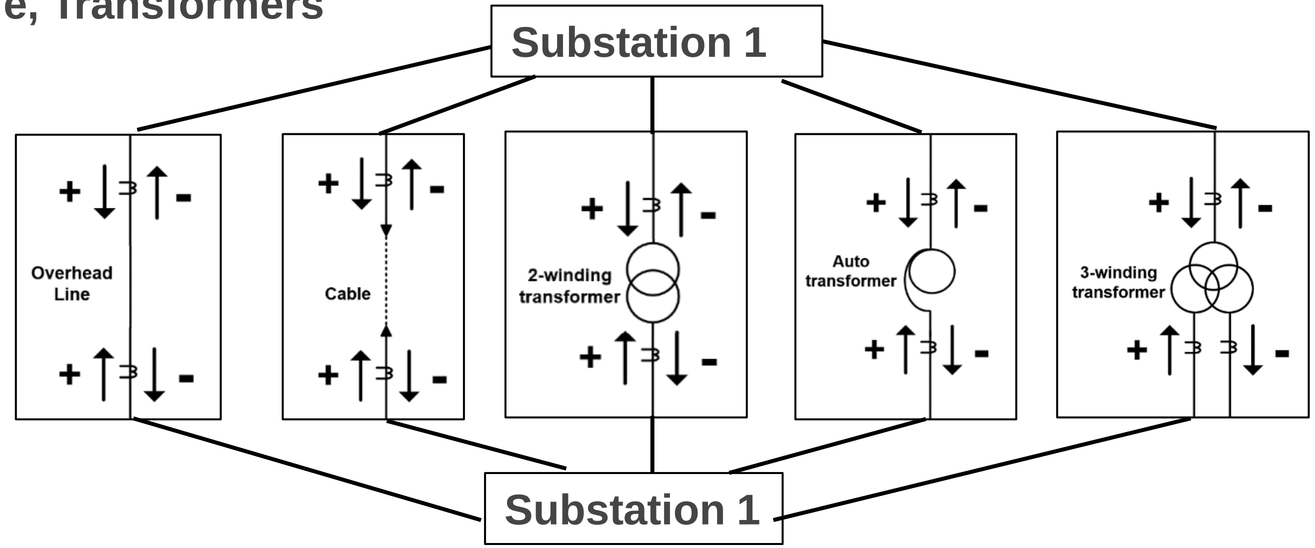
Power Flow Metering Polarity - Proposed Solution and Benefits

- **Proposed Solution**
  - To develop a unified power flow polarity standard in the form of a diagram
  - To publish the diagram as an Appendix in Grid Code (with other codes referencing this in the Grid Code)
  - To improve/modify processes between NESO and other parties so that the standard will be followed and referenced when setting up new metering connections to NESO SCADA
  - To ensure the polarity standard is followed during the repair of existing metering connections

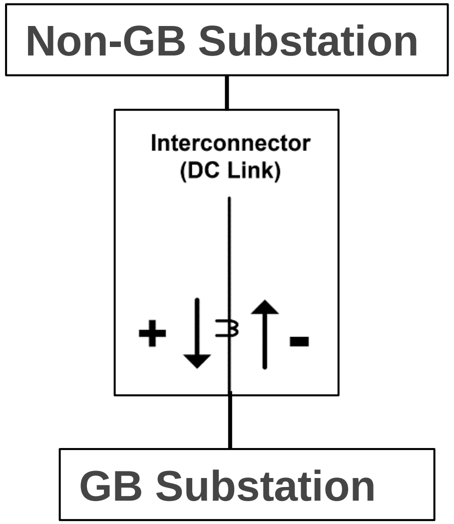
- **Benefits**
  - Improved situational awareness, system security, better forecast and reduced balancing cost
  - Reduce and/or mitigate iterations and delay for setting up new connections and approval for outage and commissioning
  - Improved coordination, efficiency and transparency between NESO and other parties following unified polarity standard and standardised process

Power Flow Metering Polarity – Key Principle

- **Connections between Substations: Line, Cable, Transformers**
  - leaving substation is positive '+'
  - entering substation is negative '-'



- **International Interconnectors:**
  - entering the GB substation is positive '+'
  - leaving the GB substation is negative '-'



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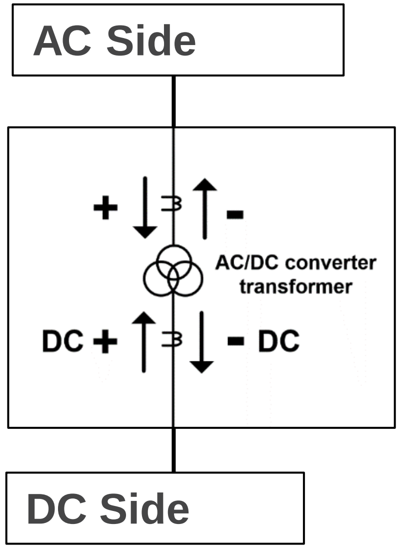
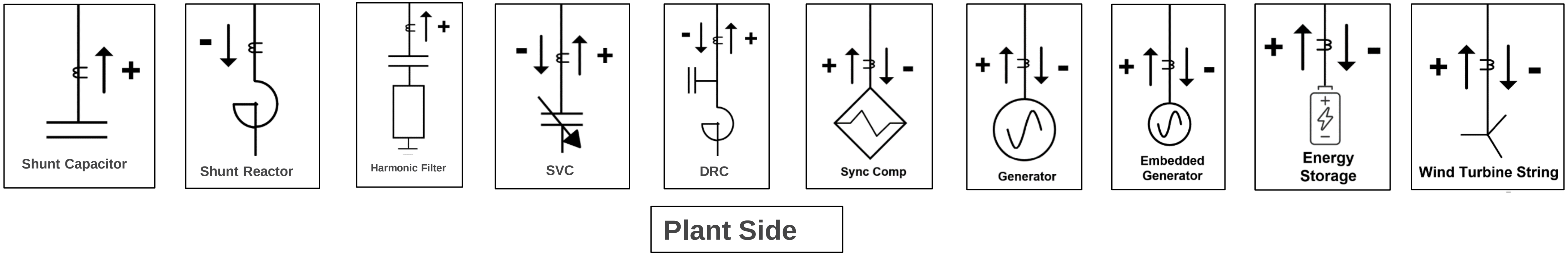
Power Flow Metering Polarity – Key Principle

- **Internal HVDC Links:**
  - entering AC/DC converter is positive '+'
  - leaving AC/DC converter is negative '-'

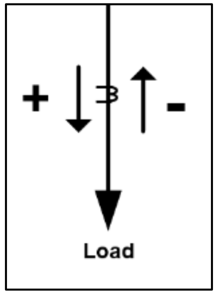


- **Reactive Equipment and Generator:**
  - leaving the plant is positive '+'
  - entering the plant is negative '-'



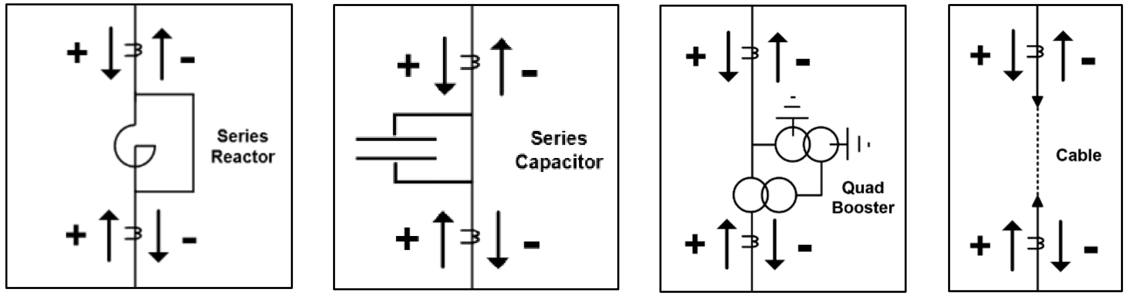
Power Flow Metering Polarity – Key Principle

- **Load:**
  - leaving the plant is positive ‘+’
  - entering the plant is negative ‘-’



Plant side

- **Series Connected Reactive Compensation and connections within a substation (e.g. a cable section):**
  - entering the device is positive ‘+’
  - leaving the device is negative ‘-’



AOB

Existing and prospective customers are invited to attend our **Customer Connections Seminar London 2024.** Join us to learn more about the wider connection's agenda with focus on upcoming reform.
You can register for the Seminar here.

Want to continue to hear from us as NESO?
We became NESO on **1 October**. Sign up to our weekly newsletter and select Codes - Grid Code to keep up to date. If you haven't subscribed, you will have stopped hearing from us from **1 October**. Subscribe to our NESO newsletter here.

Electronic Data Transfer (EDT) Exceptions Scenarios Process.

Stuart Brace

Agenda

1. Background
2. Solution
3. Registration Process
4. Exceptions Scenarios Process
5. Questions

1. Background

Over the last couple of years NESO and SSE have been working together to establish an alternative arrangement for EDT data submissions in the event of a critical unplanned outage.

There is a concern where, if a Market Participant suffered a critical unplanned outage that affects their EDT system for an unforeseeable time, this could lead to the Balancing Mechanism (BM), within the control room, becoming outdated causing a lack of visibility of the participants BM units which in turn could lead to the removal of units from the NESO system.

2. Solution

The EDT Exceptions Scenarios process has been developed that allows the Market Participant to submit EDT data via an agreed template and sent electronically to the NESO control room. This data will then go through validation checks then flow into the BM giving the control room visibility of the up-to-date data of the affected units for that participant.

This is an automated process within the control room, once the account is activated, which will help manage additional workload and communications between the two parties at these unforeseen times.

3. Registration

Under normal conditions the EDT data within BM can only be updated via a secure communications channel.

This new process will allow data to be sent to an email inbox where the BM will access this data. To ensure that we keep this process as secure as possible we have developed a registration element to this service where the Participants needs to complete before being able to use this service.

We will have a form on our external website for the Participant to complete with details such as

- Email address to be used (This could be external from standard company communications)
- BMU ID’s
- Company name
- Trading Agent name for above BMU’s
- Senior Management contact details

This form is then sent to the BM Registration team who will process this and check the data supplied matches what we have in our BM Registration system. If the data checks are successful, the BM team will then update BM with the Company name and email addresses that will be used as part of this service.

4. Exceptions Scenario Process

This process shall only be triggered when senior management from both companies have agreed to invoke this process.

On agreement from senior management to allow this process to be utilised the Trading Agent shall contact NESO control room and request their units to be activated in the EDT Exceptions Scenarios process.

- The NESO Control Room will activate the process.
- The participant shall then submit their EDT submissions via email.
- BM will then verify the data and import that data.
- Trading Agent to inform Control Room when EDT is back to normal service.
- The NESO Control Room de-activate process.

5. Questions ?

Fax Replacement Within NESO

GCDF – 02-Oct-24

Fax Replacement within NESO

1. Overview
2. Access and Use
3. Screenshots
4. Security
5. Risk Mitigation
6. Reliability
7. Phased Launch and Proposed Code Change Governance Route

Overview

Business Drivers

- At the end of 2027, BT will be shutting down the PSTN network upon which the FAX machines rely.
- NESO would like to move away from this paper-based model to a digital solution.
- The new solution needs to be:
  - Easily adopted by existing and new market participants.
  - Secure.
  - Meet the needs of the market participants and NESO.
  - Deployed with minimal complexity / risk .

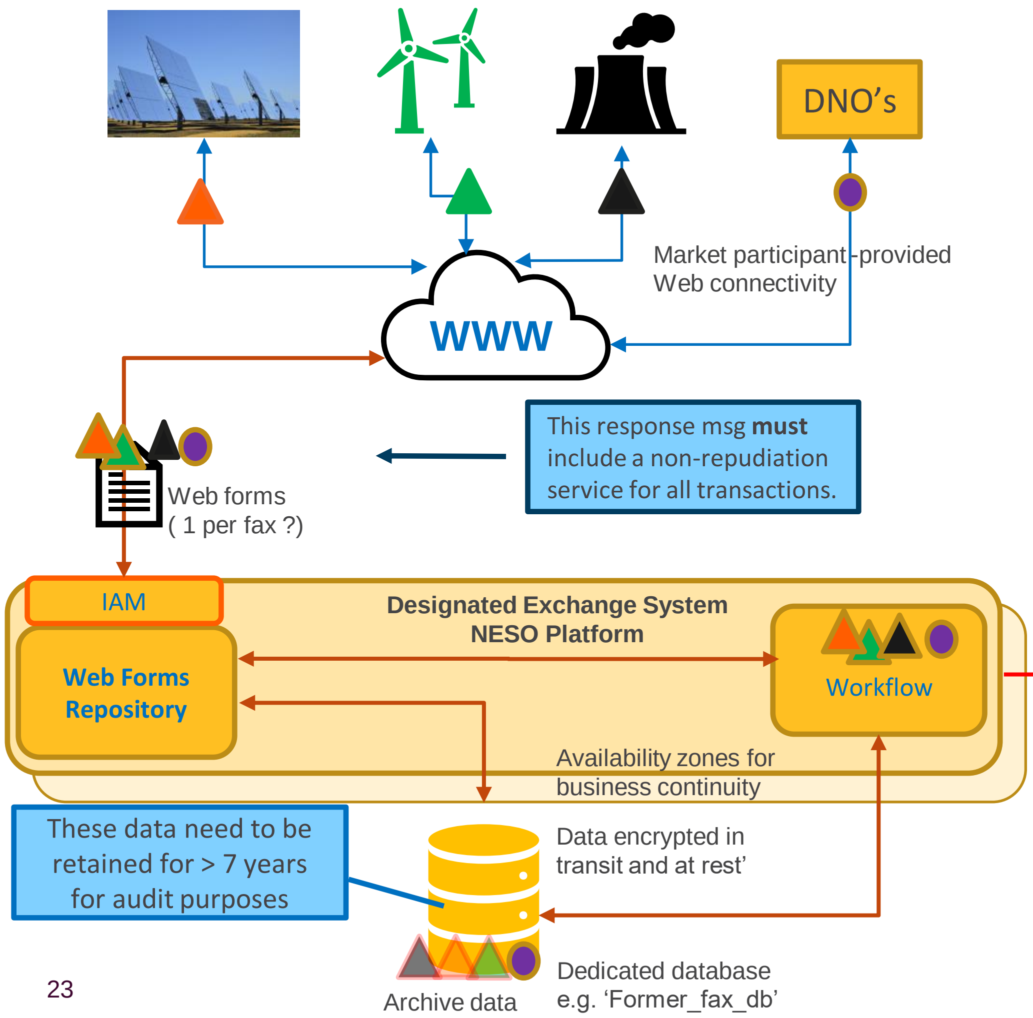
Principles

- The new technology being proposed to replace the use of the fax machine will be defined under an umbrella term of the “Designated Exchange System”. This definition will help to ensure any further enhancements will not require any future code changes.
- Phased approach to digitisation (not ‘big bang’).
- Reduce dependencies on other projects wherever possible.
- Security by design.
- Re-use / leverage existing platforms and technologies where appropriate .
- Adaptable for future developments e.g. the Open Balancing Platform (OBP).
- Provide all parties with the delivery / receipt assurance required.

Overview (phase 1)

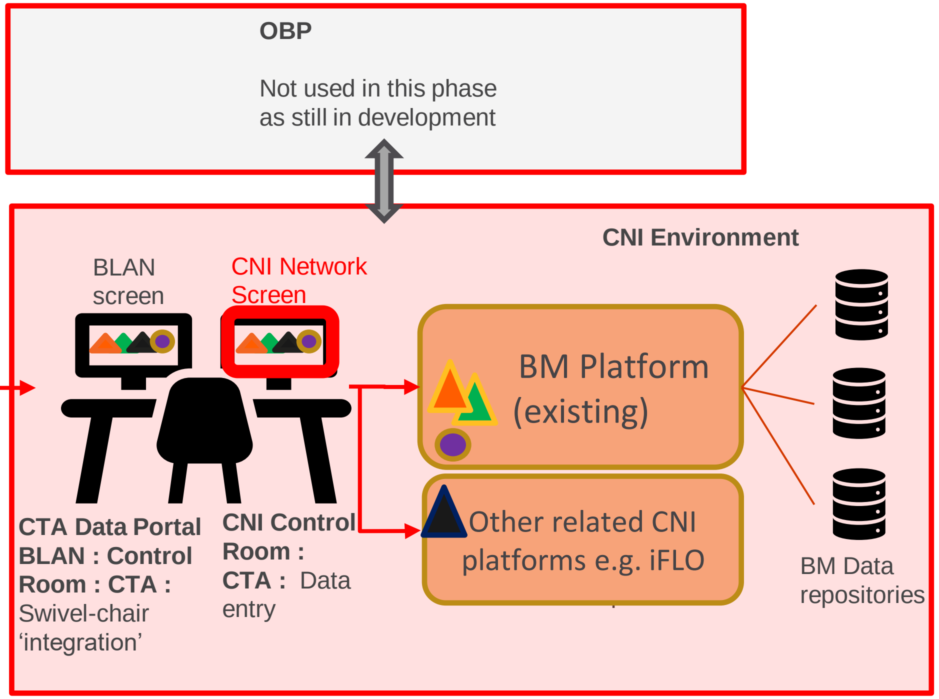
Shapes denote ‘fax data’ from market participants

All MPs (BMU / Non-BMU)



Solution summary : Phase 1

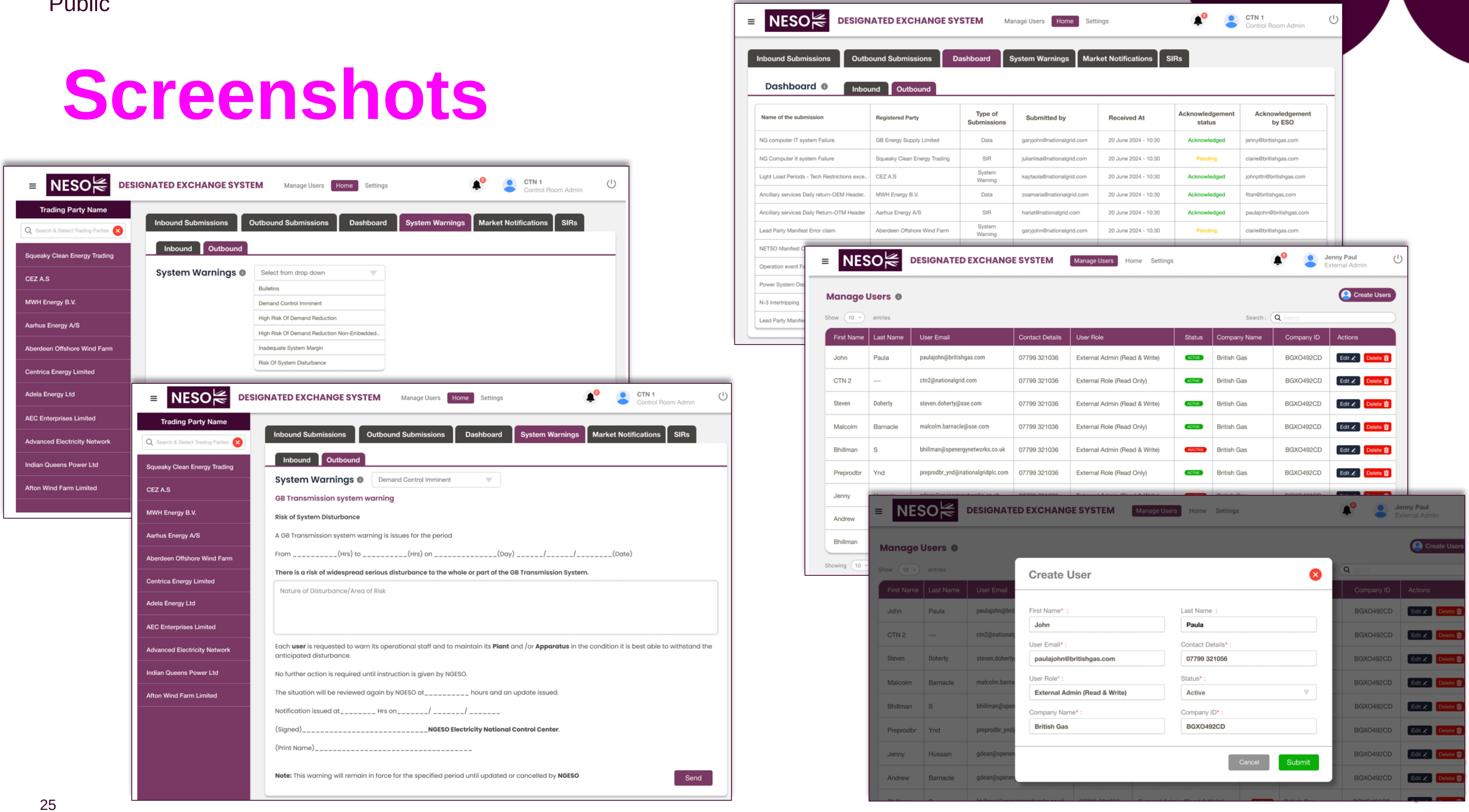
- Faxes are eliminated in a phased manner, and replaced by web forms to gather data
- Data capture for Phase 1 is via a web ‘form’ which enables *all* participants to use digitised data
- Lowest risk / fewest dependencies on other programmes / platforms



Access and Use

- Users will register details on first use to create an account.
    - First Name, Last Name, Email ID.
    - Company Trading Name. Company Trading ID.
    - Contact number.
- Subsequent access will require identification and authentication.
- NESO control room users will be able to view and respond to all incoming requests.
- Market Participants will only be able to see their own submissions and responses from NESO control room.
- Users will complete a web form with the same data that is currently faxed.
    - Each paper fax has a corresponding web form.
    - Data are entered using a combination of drop downs, tick boxes and free text.
    - Validation will be performed on several fiel.ds to help prevent errors.

Screenshots



Security & Availability

- Encryption
  - All data will be encrypted in transit and at rest.
- User authentication
  - All users will be required to login to the platform using a named user account .
- Auditing
  - All actions by DES users will be recorded in the database for audit purposes.
- Availability
  - The platform will be designed to be highly available, running across multiple-regions and availability zones.

Risk Mitigation

- Reducing risk by decoupling from other programmes:
    - This phase builds the DES portal without any integration into other platforms such as OBP.
    - We are not dependent on other programmes delivery timescales.
    - Enables a quicker delivery and fast decommissioning of faxes.

- Data validation
    - The risk of erroneous data is mitigated by the NESO Control room performing a review and approval function prior to the data being submitted into NESOs systems

- Impact on market participants
    - We will adopt a phased approach, deploying the least critical 'fax' messages first to validate the platform and gather user feedback to deliver iterative enhancements.

Reliability

- Current Fax Machines use BT PSTN phone network:
    - Reliant on availability of BT exchange – no power at the exchange, no fax.
    - Localised failures of BT exchanges could impact individual BMUs.
    - Faxes are fallible – they are not 100% available.

- Solution is based on cloud-computing (Azure):
    - Aim is to exceed the 99.95% availability figure for BM.
    - Extensive high availability and recovery options are available.

- Dependency on reliable internet connectivity
    - Access is through a web page, so a reliable internet connection is essential (to be provided by the market participant) .

Phased Launch and Proposed Code Change Governance Route

- Phased launch approach – “big bang” too risky.
    - Roll-out access ot the DES portal to users over a number of weeks.
    - Target the high priority and most frequently used templates first.
- The formal Grid Code and CUSC Proposals will be raised at the October Panels.
- Propose the “Self-Governance Modification to proceed to Code Administrator Consultation” based on the following rationale.
    - Feedback from Industry has shown that Users are keen to move away from fax machines which is aged technology.
    - No new additional obligations are being created, with the proposed changes introducing a different communication method for fulfilling current actions that take place via fax.
    - The phased launch described above will ensure Users only fully move away from faxes once they are comfortable with the proposed new platform.

Note: Separate discussions will need to take place with Transmission Owners in respect of proposed changes to STC Procedures.

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Thank You


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