

A photograph of a person with blonde hair, wearing a denim jacket, with their arms raised in the air. They are standing in a field at sunset, with a crowd of people and tents visible in the background. The sky is a mix of orange, pink, and purple. There are some white decorative lines on the left side of the image.

# Control Room FAX Replacement

## GCDF Update

May 2023

# Problem Statement : Summary

## Overview

ESO currently use Fax machines (located in the Control rooms) to send and receive data from Primary and some secondary BMUs. Some of these data support critical functions such as System Restoration by transmitting data such as Unit Availability. The existing fax machines are ageing, hardware support contracts are ending (or have ended) and replacement parts are difficult to source. The paper output is also time-consuming to manage (file) and report on / audit.

## Problem Statement

The Control rooms currently use fax machines to send and receive data from primary and secondary BMUs. The telecommunications network that the fax machines use (BT's PSTN) is due to be decommissioned at the end of 2025, leaving ESO with the only option of upgrading the fax machines to use digital lines (a solution that still does not address the ageing hardware / paper management workload issue) or finding a replacement for the services provided.

## Recommended approach

*Assess the viability of designing / building (or purchase) and an API-based, multi-user cloud-enabled platform that all Units can use to send and receive data. The use of APIs enables the existing software vendors to build integrations into their software platform thus minimising the impact to exist Users and enables new market participants to more easily engage with ESO. The adoption of an API-based architecture also aligns with the ESO Architecture strategy.*

***Note that this functionality will be used across multiple industry partners who have varying degrees of technical capabilities. Engagement with the User community will be essential to ensure the solution delivered meets their (and ESOs) needs.***

# Existing platform

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- FAX machines are located in the ESO Control Rooms (note they are not connected to any data networks; they are solely telco-connected devices.)
- Control room users are responsible for the actioning of FAX instructions / messages and also for the filing of the paper copies for audit purposes.
- The primary BMUs use the FAX services to advise ESO of availability which in turn enables ESO to maintain the System Restoration situational awareness as well as ensure the Grid can be balanced and secured.
- The telecommunications infrastructure that the Faxes use (PSTN) is being decommissioned by BT in 2025 <https://business.bt.com/why-choose-bt/insights/digital-transformation/uk-pstn-switch-off/>

# Future Operational needs

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The new platform / services must provide the following :

- A standards-based architecture : e.g. an API-based platform
- Able to be adopted / integrated by other Industry service providers (open standard)
- A means of providing access to all (current and future) market participants in a way that is affordable and does not pose as a barrier to market entry (IP capable )
- Reliable (at least 99.99% available)
- Secure ; use of encryption
- Provide stringent identify and access management
- Assured : Provides non-repudiation / delivery assurance features
- Extensible and Scalable : can be extended to meet future needs

# Personas and Use Cases : Future use

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**Control Room User Interaction** : The Control Room users will need to **review** and **approve** certain transactions that are being sent electronically (what is termed Priority 1 faxes); meaning that any 'portal' that gathers these data will need to have a near-synchronous presentation of data to the CNI environment. This will require careful consideration of secure access to CNI or presentation of the data to the Control Room via the non-CNI business network (noting the constraint this imposes on data consumption by Critical National Infrastructure (CNI) systems.

## Operational Considerations

The fax machines provide the following functionality :

- Transmission of data from BMUs that are critical to system restoration planning e.g. Notices of availability
- Receipt of transmissions (for all market participants)
- An audit trail
- Provision of functionality that is not available in BM

Note : Faxes are *not* used during System Restoration events: this is initially conducted using phone lines to instruct BMUs and establish the required power islands in line with the System Restoration Plan

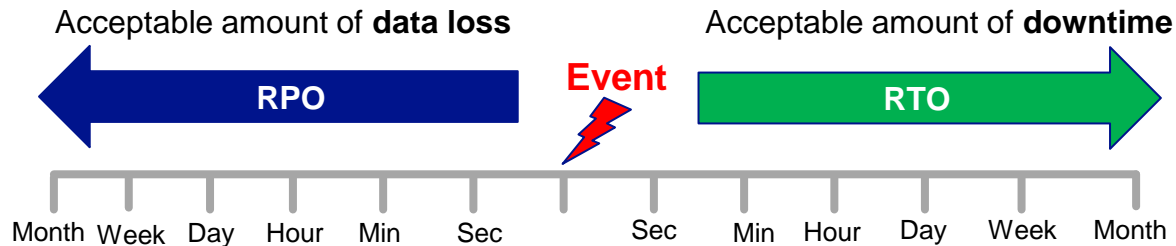
**Note** : The Control Room users need to act on data received and confirm that it has been received e.g. Unit availability data used for System Restoration Planning (BlackStart); this requires an async messaging capability and access to the platform and data from within the CNI control room

## A note on platform availability

A number of views have been expressed regarding the availability provided by platforms such as faxes or cloud-computing platforms. The following is aimed at providing clarity on this :

**Fax machine connectivity** : These use the BT phone network, which relies on the BT exchanges being available. If an Exchange fails, the continuation of the service is not assured. Localised failures of exchanges could impact individual BMUs. Faxes are fallible and have dependencies on 3<sup>rd</sup> parties to operate.

**Cloud-computing platforms** are designed to be highly available and offer extensive high-availability and recovery options, both within the datacentre itself and across remote datacentres. It is possible to design a solution that uses Cloud which can offer 99.99% availability for some services (exceeding the CNI requirement of 99.95%), however, as with the PSTN network, connectivity to the Cloud datacentres is a dependency.



# Strategic Options

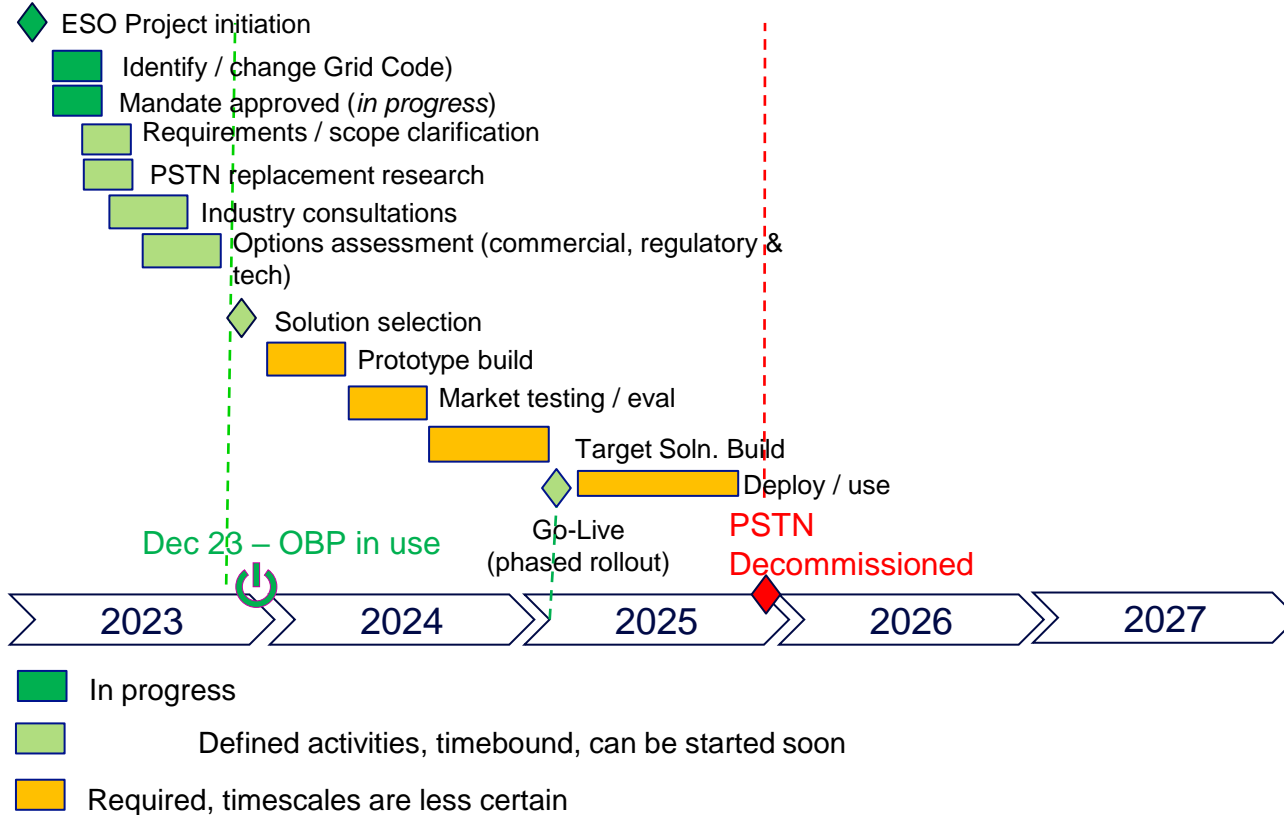
Option Name	Description	Advantages	Disadvantages
<b>Do nothing</b>	Leave the current platform in place; no adaptations	Minimal <i>initial</i> cost, little change	Will cease to function after PSTN network decommissioned in 2025. Significant disruption to ESO market, <b>significant threat to Grid stability and system restoration capabilities</b> . Regulatory breach. <b>Significant</b> remediation costs and fines.
<b>Retain and update the fax machines to use digital telco lines</b>	Update fax machines to use digital transceivers	Enables fax machines to continue to be used. Virtually no disruption to existing Users. Low cost. Enables us to focus on delivery of OBP and NCMS whilst maintaining the fax service	Management of paper output still resource intensive. Presents a barrier to new market participants.
<b>Hybrid : Extend EDT Msgs for BMUs and build / buy an API-enabled Portal for all other users (segmented user base)</b>	Create new services in EDT/EDL for Primary BMUs and create a Web portal for Secondary BMUs and ancillaries,	Leverages investment in EDL/EDT Creates a modern, scalable online portal which will facilitate the easy adoption of ESO services for new market entrants	Retains and extends the use of an obsolete protocol (FTP),  Duplicates functionality across disparate platforms  Connections into Warwick datacentre will need to be removed and re-established elsewhere; added complexity for FSO separation.
<b>Expand on <i>existing</i> web-enabled platforms such as WAAPI or Single Markets Platform</b>	Develop WAAPI further to include the messages currently transmitted by faxes.	Build once, re-use many times Native API compliance ; easier adoption by new Market entrants No NG Datacentre dependency / future migration. No FSO-specific complexity. Could leverage the DEP expertise. Provides single source for audit purposes	Needs to be built from scratch Availability (RTO/RPO) capabilities need to be evaluated to ensure a fit with ESO's needs



## Strategic options (cont)

Technology	Description	Advantages	Disadvantages
<b>COTS 'Trading' platform</b>	Use a COTS trading platform such as Bloomberg's 'Terminal' platform	Existing platform Developed with non-repudiation by default (useful for Acks of messages) Generally designed to be secure and support high-volumes of messages	3 <sup>rd</sup> Party operation (security concerns) ? Ability to be customised to meet ESOs requirements Licence model – per user based (\$20K per user) Requires Bloomberg-supplied hardware, potentially acting as barrier for wide-spread user adoption (especially the smaller, market entry users)

# Indicative Transitional Timelines



## Notes :

- Timescales are draft, more detailed planning exercise required.
- ISDN / PSTN activity included due to dependency overlap with faxes
- Beyond 2026 it is possible that digital adapters can be used to extend the life of fax machines but the devices themselves are becoming more difficult to maintain / keep running

# Supporting Information



# Availability measures : future platform

## Service Criticality

Critical

## Service Availability

What hours do the business require the solution to be available

24 / 7

## Recovery Time Objective [RTO]

In the event of an outage, how long can the business cope without this system

12 hours (based on Primary BMUs with frequency monitoring capabilities supported by phone lines for instructions / critical updates)

## Recovery Point Objective [RPO]

On restoration of service, what amount of data loss can be tolerated?

TBD (likely to be <1 Day)

Note that in the event the faxes are not available, critical instructions can still be sent using EDL and phones (via Vodafone network) can be used for additional comms)

