

# Skip Rate RCA Outcomes

Dispatch Transparency  
Programme

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# Introduction

Focused on **real-time balancing skips** (Stage 5 & 6 Post System Action)

## **Purpose:**

Understand why skips occur in the Balancing Mechanism and how to reduce them.

## **Objectives:**

- Identify root causes of skips.
- Improve transparency.
- Develop actionable recommendations to reduce skips.

## **Approach:**

Two phased approach

Phase 1: hypotheses generation and data exploration

Phase 2: quantification, validation, causation and recommendations.

# Project background & methods

# Phase 1: Hypothesis Generation



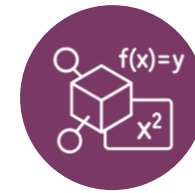
**Workshops**



**Exploratory Data  
Analysis (EDA)**



**Hypothesis  
Generation**



**Modelling  
Techniques**

## Phase 1 aim

Use **workshops** and **EDA** to **generate & prioritise hypotheses** and identify suitable **modelling techniques** for Phase 2.

| Category                          | Example Hypothesis                                                                                                        |
|-----------------------------------|---------------------------------------------------------------------------------------------------------------------------|
| <b>Market Impacts</b>             | BMUs are more likely to be skipped when NESO are procuring more volume to create positive reserve.                        |
| <b>Operational Discretion</b>     | BMUs from certain technology types may be accepted out of merit by ENCC engineers during difficult system conditions.     |
| <b>Methodological Limitations</b> | BMUs that actively hold MFR have a higher likelihood of being skipped to maintain capacity to provide frequency response. |
| <b>System Errors</b>              | BMUs are skipped due to inefficiencies within SORT's zonal despatch advice algorithm.                                     |
| <b>Forecasting Errors</b>         | Demand forecasting errors from T-1 to real-time increase uncertainty, which results in an increased number of skips       |
| <b>Technical Limitations</b>      | BMUs with high MNZT (Minimum Non-Zero Time) have a higher likelihood of being skipped during rapid system changes.        |

## Phase 2: Hypothesis Evaluation

### Phase 2 aim:

Utilise advance **data driven techniques** to quantify and validate hypotheses. Ultimately to infer **causation** and identify **actionable recommendations**.



### Individual hypothesis analysis

- **Prepare data:** clean, transform and align inputs for each hypothesis
- **Quantify relationships:** Pearson, Spearman, mutual information and lagged effects
- **Test causality:** Granger tests with stationarity checks, differencing and lag-order selection
- **Model predictive signal:** OLS, VAR, ridge, gradient-boosted trees and random forest



### Multivariate causal modelling

- **Direct causal modelling:** DirectLiNGAM, permutation importance and SHAP values
- **Advanced inference:** double machine learning, counterfactual analysis and CATE

# Hypothesis outcomes

# Phase 2: Outcomes

The quantitative evaluation of high priority hypotheses was concluded in April 2026.

**Note:** many of these hypotheses capture multiple sub-hypotheses

## Method limitations

### Mandatory Frequency Response (MFR)

Units providing MFR may appear accepted out of merit or skipped.

**Strong Impact** | **Conclusion:** methodology update implemented 

### Spin Gen & Spin Pump

Units providing Spin Gen or Spin Pump may appear as skipped.

**Moderate impact** | **Conclusion:** quantified and added to minimum target 

### 5% constraint buffer

The skip rate method assumes a 5% safety margin for managing constraints, which may result in skipped volume.

**Weak impact** | **Conclusion:** retain assumption 

### Ramp rates

The skip rate method doesn't account for unit ramp rates, which may limit a unit's ability to meet a dispatch requirement.

**Weak impact** | **Conclusion:** ramp rates alone, have no measurable relationship with skips. 



Concluded



Ongoing



## Phase 2: Outcomes

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### Market Impacts

#### Volume of actions taken to create positive reserve

More actions taken to create positive reserve may result in more skipped volume.

**Weak impact** | **Conclusion:** initial correlation likely spurious, given detailed causal modelling



#### STOR

Units contracted to provide STOR may be skipped to preserve their volume for largest loss events.

**Weak impact** | **Conclusion:** no measurable relationship



#### Quick, Slow & Balancing Reserves services

Units contracted to provide reserve services may be skipped or accepted out of merit to fulfil the market's purpose.

**Strong Impact** | **Next steps:** account for volume going forward



Concluded



Ongoing

## Phase 2: Outcomes

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### Forecasting Errors

#### Forecasting (wind, interconnectors, day-ahead demand)

Errors in forecasts may lead to accepted out of merit or skipped volume.

**Wind** = **Moderate impact** | **Next steps:** relationship is non-linear, further investigation required 

**Others** = **Weak impact** | **Conclusion:** no measurable relationship 

#### Demand Predictor

The control room's demand prediction, within 1 hour of real-time, may be resulting in skips.

**Weak impact** | **Conclusion:** no measurable relationship 



Concluded



Ongoing

# Phase 2: Outcomes

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## System Errors

### Open Balancing Platform

Characteristics of the Open Balancing Platform may result in skips.

**Moderate impact** | **Next steps:** ongoing monitoring of impacts 

### SORT Dispatch Advice

The control room's optimised dispatch advice may be leading to skips.

**Moderate impact** | **Next steps:** monitor improvements from system updates. 

## Technical limitations

### EDL/EDT connection errors

Communication between BM unit operators and the control room, via EDL/EDT links, is unavailable.

**Moderate impact** | **Conclusion:** measurable impact on skipped volume. 



Concluded



Ongoing

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### Operational Discretion

#### Operational Discretion

Individual operator decision making.

**Weak impact** | **Conclusion:** minor relationship observed, with clear limitations.

**Next steps:** increase analysis precision, refresh consistently.



#### Maintaining headroom

Maintaining headroom, in the lead up to peak, for optionality may lead to skipped volume.

**Moderate impact** | **Conclusion:** clear relationship for some units.

**Next steps:** investigate specific units with clear relationship.



#### Difficult system conditions

A variety of difficult system conditions may be leading to skips.

**Weak impact** | **Conclusion:** no measurable relationship



#### Replacement energy

Large volumes of offers required to replace wind bids may result in accepted out of merit volume.

**Moderate impact** | **Next steps:** further investigation required.



Concluded



Ongoing

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### Operational Discretion

#### Zonal allocation

Volume that was skipped because of volume being accepted out of merit in a different zone.

**Strong Impact** | **Next steps:** monitor as system upgrades are implemented



#### Frequency

Volatility or large deviations in frequency lead to skipped volume.

**Weak impact** | **Conclusion:** no measurable relationship



### Multi-variate complexity

#### Multivariate analysis

Multiple variables compound to drive a high proportion of skipped volume and skip rates.

**Moderate impact** | **Conclusion:** inconclusive outputs from a complex landscape of drivers.



Concluded



Ongoing

# Conclusion & next steps

# Conclusion

It's clear the drivers of skips are **complex, vast** and **multifaceted**.

Where there are relationships, they tend to be non-linear, intermittent or contradictory.

**25** hypotheses investigated, **>25** datasets acquired, **>70** (>420 inc. lags) variables evaluated, and **>8000** causal model combinations compared.

## Key findings

- **Methodology limitations** such as MFR and ancillary services have shown the largest impact.
- **Pre-BOA power flow across constraints** has a complex causal relationship with skip rates.
- Other hypotheses explain skipped volume or have correlations with skip rates, highlighting areas for action and further investigation.
- **Operator analysis** (anonymised) showed relationships were weak for total experience and moderate for individuals with fewer shifts in the dataset (with clear limitations).

# Next steps

The next steps will continue our work to understand why skips occur in the Balancing Mechanism and how to reduce them.

## **Deepen skip-rate analysis**

Refine key hypotheses and their analysis, including replacement energy, BESS behaviour, NDO impact and NBE decisions.

## **Update forecasting drivers**

Review updated demand, wind and interconnector forecasts and their errors.

## **Solidify learnings & improve tooling**

Automate explanations and align findings with long term strategy.

## **Build capability and alignment**

Share findings with relevant teams and incorporate insights into staff training.

## **Monitor and revalidate**

Track trends and periodically repeat analysis to observe changes.



# Appendix

# Quantifying impact

Impact is measured in three broad categories:

1. Change in skip rate
2. Proportion of skipped or accepted out of merit volume impacted
3. Modelling metrics (correlations, predictive power, causal coefficients)

The table below indicates ranges for the definition of Weak, Medium and Strong impact

| Category                                      | Weak                    | Moderate             | Strong       |
|-----------------------------------------------|-------------------------|----------------------|--------------|
| Skip rate                                     | Weak < 0.5%             | 0.5% < Moderate < 2% | 2% < Strong  |
| Skipped or accepted out of merit volume       | Weak < 1%               | 1% < Moderate < 5%   | 5% < Strong  |
| Modelling metrics: Correlations               | Weak < 0.3              | 0.3 < Moderate < 0.7 | 0.7 < Strong |
| Modelling metrics: Predictive importance      | Not fixed or normalised |                      |              |
| Modelling metrics: Causal impact on skip rate | Weak < 0.5%             | 0.5% < Moderate < 2% | 2% < Strong  |

**Note:** some judgement is required, where one or more are relevant.