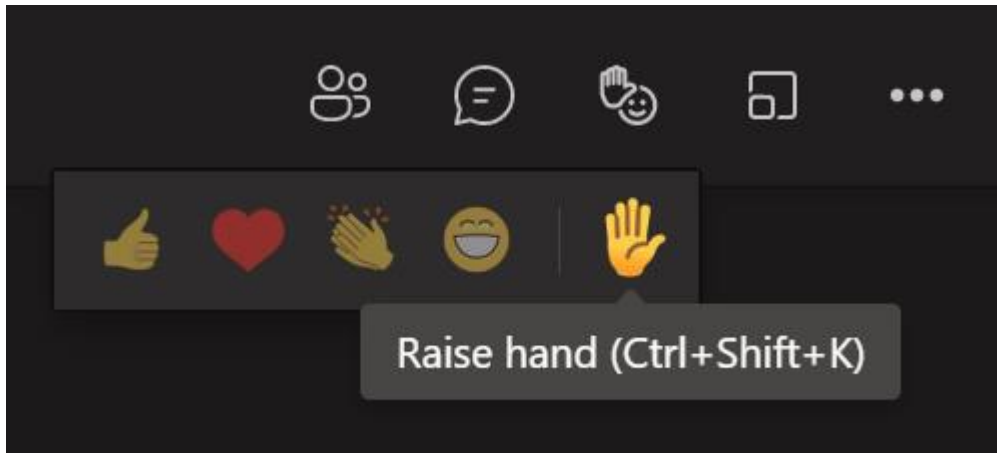


Issue 100 Digital Meeting Etiquette

- Welcome to **Issue 100 ‘Assessing BSC Black Start processes to support NGESO’s Distributed ReStart project’** Workgroup Meeting 1 – we’ll start shortly
- No video please to conserve bandwidth
- Please stay on mute unless you need to talk – use the **Raise hand** feature in the menu bar in Microsoft Teams if you want to speak, or use the **Meeting chat**



- Lots of us are working remotely – be mindful of background noise and connection speeds

ELEXION

Issue 100 Workgroup 1

‘Assessing BSC Black Start processes to support NGESO’s Distributed ReStart project’

24 June 2022

Meeting Agenda & Objectives

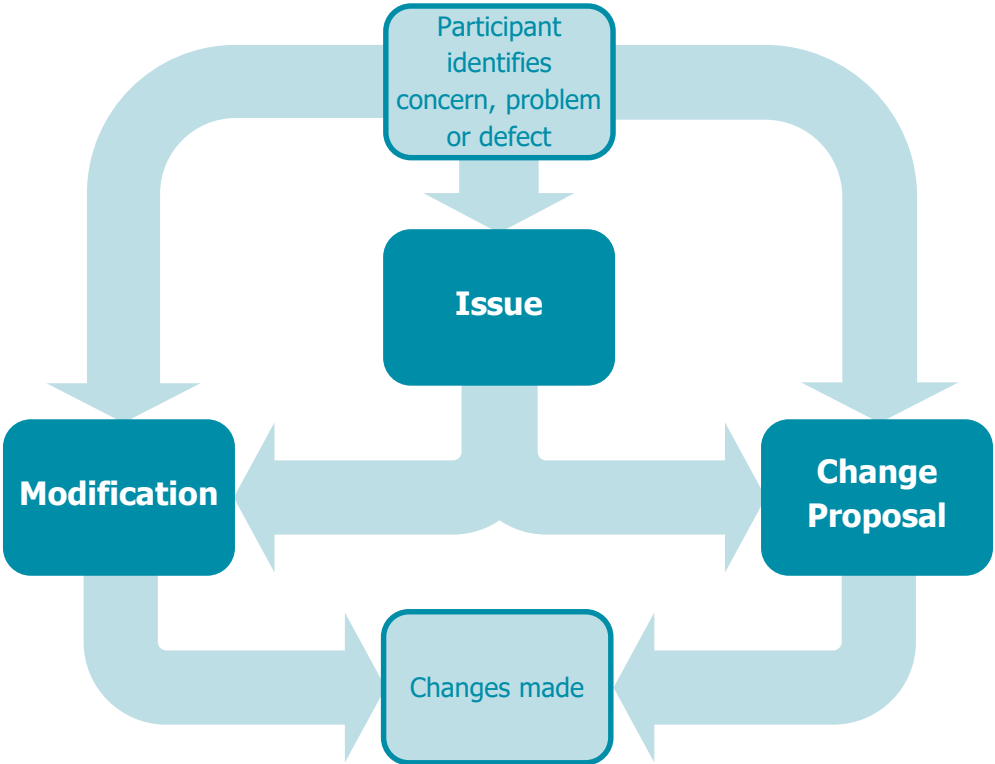
- Consideration of the background to Issue 100
- Consideration of the potential BSC impacts
- Agree areas for further development at future meetings

Agenda Item	Lead
1. Welcome and Meeting objectives	Chris Arnold (Chair)
2. BSC Issue process	Paul Wheeler (Lead Analyst)
3. Background - Distributed ReStart project	Ken Doyle (Proposer, National Grid ESO)
4. Overview of Issue 100	Ken Doyle
5. Related Grid Code Modifications	Ken Doyle
6. BSC impacts and considerations	Nicholas Rubin (Design Authority) and Richard Baker (SME)
7. Discussion	Workgroup
8. Next steps	Paul Wheeler
9. AOB & Meeting close	Chris Arnold



BSC ISSUE PROCESS

		Will my solution amend the BSC?	
		Yes	No
Do I have a clear solution?	Yes	Modification	CP
	No	Issue	Issue



BSC changes (2 of 2)

- **Modifications** – these are raised to introduce changes that would alter any part of the BSC legal text. Any Code Subsidiary Documents (CSDs) or BSC Systems impacted by the proposed changes would also be updated as part of the Modification. A Modification will typically take six to eight months to be progressed to a final decision, and will then take further time to be implemented, depending on the required lead times

<https://www.elexon.co.uk/change/modifications/>

- **Change Proposals (CPs)** – these are detailed proposals which are raised to amend Code Subsidiary Documents (CSDs) and/or BSC Systems, but would not alter the BSC legal text itself. A CP will typically take around three months to be progressed to a final decision, and will then take further time to be implemented, depending on the required lead times

<https://www.elexon.co.uk/change/change-proposals/>

- **Issues** – these are problems or potential issues with the current arrangements whereby the solution is unknown or undefined, so once raised will be discussed by an industry expert Issue Group to consider possible solutions

<https://www.elexon.co.uk/change/standing-modification-group-issues/>

BSC Issues – process

- There are no set timescales for Issues, so an Issue can take varying amounts of time to complete depending on the nature and complexity of the problem in question, after which a Modification and CP is required to take anything forward
- Raised if participant wants to discuss an issue or concern
- Issue Group convened to discuss the issue
- Issue Group will consider any ways forward e.g. solution (any BSC Party can take forward the outcomes of an Issue e.g. BSC Modification/Change Proposal), extra guidance, no change
- Non-BSC Parties may raise a BSC Modification subject to designation from the BSC Panel
- We will prepare a final Issue report for the BSC Panel

BSC Issue – Issue Group membership

- The Issue Group shall have a Chair and Secretary, provided by Elexon
- The Proposer of the Issue is considered an Issue Group member
- The Issue Group shall comprise of at least five members who have volunteered to join the Issue Group and have relevant experience and/or expertise in the areas forming the subject matter of the Issue(s) to be considered by the Issue Group
- Where an Issue Group member is unable to attend a meeting, they may appoint an alternate. The alternate, like the Issue Group member, shall act impartially and independently. Where an alternate attends a meeting, they shall be considered as an Issue Group member for that meeting
- Any vote shall be decided by a simple majority of those present at the meeting at which the vote takes place
- An Issue Group member may only vote if they have attended at least half of the Issue Group meetings



BACKGROUND – DISTRIBUTED RESTART PROJECT



Distribution Restoration

Ken Doyle - ESO Commercial Codes

Distribution Restoration and Electricity System Restoration Standard (ESRS)

What is NGESO's Distributed Restart project?

Distributed ReStart is a project exploring how distributed energy resources (distribution-connected plant) many of which are solar, wind and hydro, can be used to help restore power to the transmission network in the unlikely event of a blackout, i.e., provide a Electricity System Restoration / Black Start service.

This will broaden the range of providers who can offer the service, the networks it can be provided from and the situations in which these providers may be utilised.

Distribution Restoration will fall under the auspices of the EU Emergency and Restoration Code and will be part of the wider Electricity System Restoration Standard (ESRS) which needs to be in place by 31 December 2026.

What is the Electricity System Restoration Standard (ESRS)?

Black Start is the process used to restore power in the event of a Total Shutdown or Partial Shutdown of the National Electricity Transmission System, as described in Operating Code (OC) No. 9 of the Grid Code.

In April 2021, BEIS released a policy statement setting out the need to introduce a legally binding target for the restoration of electricity supplies in the event of a National Electricity Transmission System (NETS) failure. This new policy is called the Electricity System Restoration Standard (ESRS) and requires NGEN to be capable by the end of 2026 of restoring 60% of demand (all regions) within 24 hours and 100% of GB demand within 5 days.

The related BEIS and Ofgem initiated licence modification decisions were implemented on 19th October 2021. These modifications include introducing the definition of “restoration services” in Standard Condition C1 and amending the definition of balancing services to include “restoration services” replacing all references to “black start” with “Electricity System Restoration” in the Electricity Transmission Licence, including in the ESO’s Special Licence Conditions, to align the licence terminology with BEIS’s policy. Grid Code modification GC0156 has been established to address these issues from a Grid Code perspective.

Current Restoration Service

The restoration service is procured from power stations that have the capability to start main blocks of generation onsite, without reliance on external power supplies. During a shutdown, the service requires the provider to start up its main generator(s), carry out initial energisation of sections of the national electricity transmission system and distribution network, and support sufficient demand to create and control a stable 'power island'.

The contracted generator may be required to provide start up supplies to other power stations as the system restoration progresses, and will eventually be required to synchronise to other power islands.

Issues

Key to providing a Black Start service is ability to start up without taking power directly from transmission/distribution networks. However, as the obligation to provide Black Start capability lies with NGENSO, there is a limited case for generators to install this capability in their designs for the plant, unless they have contracted with the ESO to provide this capability.

Also, as a number of the stations that historically have had Black Start capability (and may have had it built into the design for the stations) are now coming to the end of their expected life, the energy industry is approaching a period where a larger scale of investment is required to replace this Black Start capability.

Given the rate at which the energy landscape is evolving, it is prudent to ensure that where investment is necessary to ensure capability, Black Start should be future-proofed as far as possible. This should take into account that the number of large thermal generators connected to the transmission system has decreased and is likely to continue to do so, meaning the pool from which Black Start Capability is significantly dropping off.



OVERVIEW OF ISSUE 100

BSC Issue Description

BSC considers Black Start as being provided by the Lead Party of a BMU and so the terms describing Black Start instructions and fuel compensation relate to Lead Parties. This will be outdated when assets within a BM Unit not operated by the Lead Party of the BM Unit will be able to provide the service following NGENSO's project. It was envisaged that the BSC would provide a single and consistent place for describing compensation. Therefore, if it doesn't cover assets within a BM Unit there is a potential issue.

Issues to consider

We would like the Issue Group to consider any BSC impacts and whether any changes to the BSC, Code Subsidiary Documents (CSDs) (Balancing and Settlement Code Procedures (BSCPs), etc.) or BSC systems are required, to reflect a new approach to:

1. How distribution and transmission connected service providers should be compensated for any fuel used following a Black Start instruction?
2. The role Distribution System Operators (DSOs) and Distributed Energy Resources (DER) should play in the end-to-end Black Start process, including Metering System Identifiers (MSIDs) also registered within a Virtual Lead Party's (VLP) Secondary BM Unit.

Having considered these points, we would be seeking a recommendation from the Issue Group on the changes that should be made to the BSC and to any other Codes and related material. This could include proposed legal text changes and draft Modification Proposal Forms for the Issue Group to endorse.



RELATED GRID CODE MODIFICATIONS

Figure 19:
Timelines of different industry initiatives and implementation of Distributed ReStart project

	2021	2022	2023	2024	2025	2026	
	Dec	Jan to Jun	Jul to Dec	Jan to Jun	Jul to Dec	Jan to Jun	Jul to Dec
Distributed Restart	<ul style="list-style-type: none"> 20/12 – P&C Report: Distribution Restoration future commercial structure and industry codes recommendations and PET Report: Demonstration of Black Start from DER 	<ul style="list-style-type: none"> 28/02 - PET and OST: Outcomes of DR2-C Testing 	<ul style="list-style-type: none"> 30/06 – Project closure report 				
	PET and OST Final Proposals						
ESR Tender Rollouts	<ul style="list-style-type: none"> 04/22 Launch 	<ul style="list-style-type: none"> South East Region Tender 	<ul style="list-style-type: none"> Nov/Dec Contract award 		<ul style="list-style-type: none"> Oct – Service commencement 		
	<ul style="list-style-type: none"> Planning for SE Tender 	<ul style="list-style-type: none"> Planning for Northern tender 	<ul style="list-style-type: none"> Northern Region Tender 		<ul style="list-style-type: none"> Contract award 		
		TBC Oct/Nov Launch					
ESRS	Implementation					In force	
	Working Groups established and industry consultation published		All regulatory changes completed				
DNO/DSO plans	R&D ED1 – April 2015 to March 2023		R&D ED3 Planning				
	R&D ED2 Planning and Final Determinations		R&D ED2 – April 2023 to March 2026				
	DSO Implementation				TBC: Role coming in force		
FSO	FSO consultation and potential transition / implementation						
Codes	<ul style="list-style-type: none"> Code drafting complete 	<ul style="list-style-type: none"> Feb – Consultation 	<ul style="list-style-type: none"> Dec – Implementation 	<p>Distribution Restoration technical code drafting is currently being progressed via Grid Code and Distribution Code Modification GC0148 and separate to the ESRS. Commercial code (CUCS/BSC) changes for Distribution Restoration will be progressed and aligned with any required ESRS changes.</p>			
	GC0148 Working Group						
	STC Modification						
	BSC Issue Group consultation	BSC Modification					

Two related Modifications:

Completes the GB implementation of the NCER

Clarifies the requirements on CUSC parties, Restoration Service Providers (RSPs) and Distribution Network Operators taking part in restoration activities of their obligations so that National Grid ESO can satisfy the new ESO Licence obligation.



BSC IMPACTS AND CONSIDERATIONS

EXISTING BLACK START ARRANGEMENTS

Nicholas Rubin, Design Authority

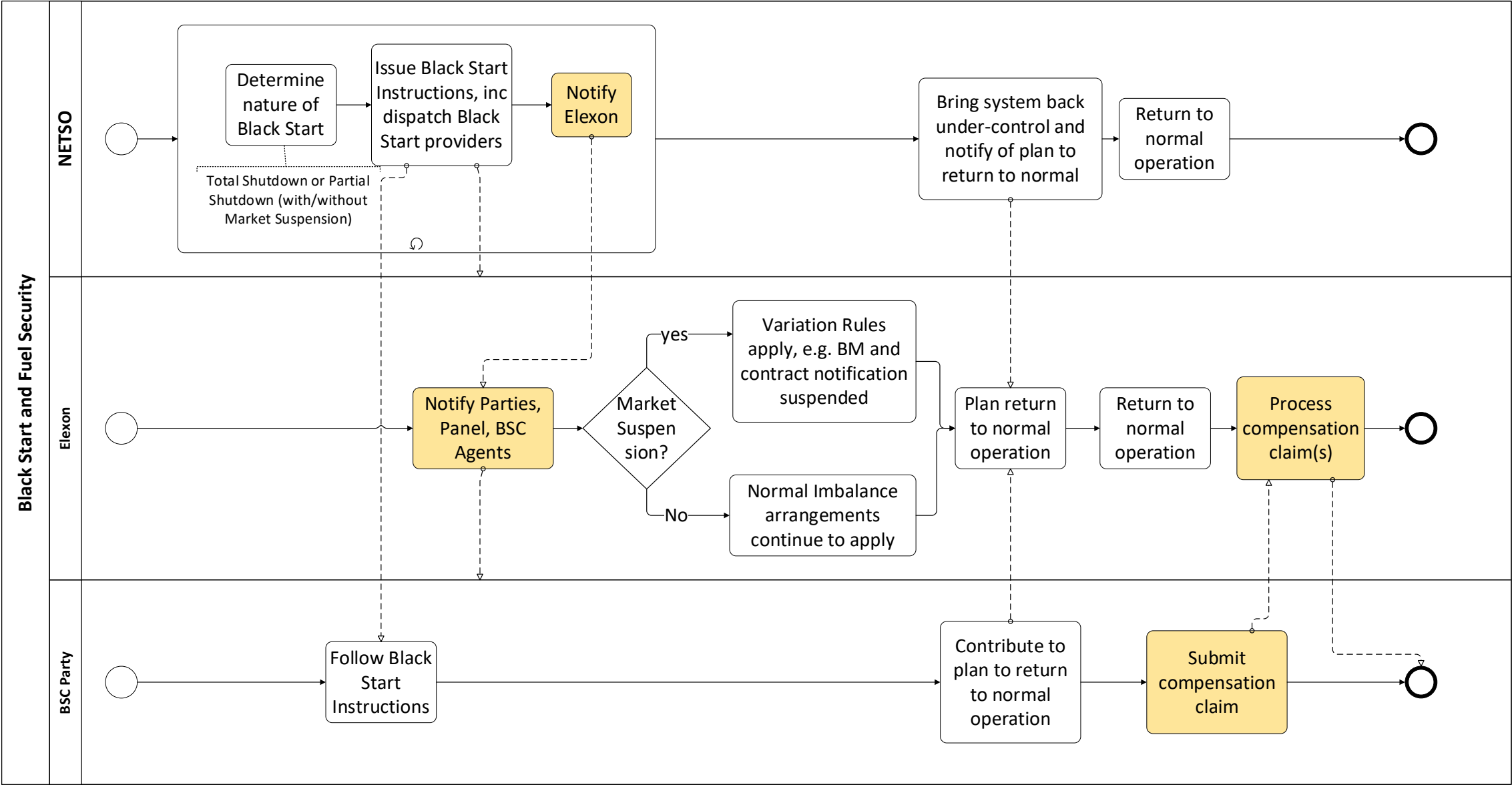
What is Black Start?

Formally known as Electricity System Restoration (ESR), Black Start is the process used to restore power in the event of a total or partial shutdown of the national electricity transmission system.

Where are Black Start provisions described?

- **Grid Code - Operating Code (OC) 9** – describes operationally how NETSO will restore the Transmission System, with support from Black Start Service Providers
- **BSC - Section G3 and BSCP201** – describes consequential actions managed under the BSC – i.e. rules for communicating details of when Black Start Periods begin and end, market suspension and subsequent claims for compensation
- **Restoration Services contracts** – in support of over-arching Grid Code requirements. Where NETSO procures Black Start Services these are typically covered by dedicated contracts between the provider and NETSO

How does Black Start work?



Existing Black Start arrangements - Compensation

BSC Parties whose BMU(s) are affected by a Black Start Instruction may submit claims to the BSC Panel's Claims Committee for 'Avoidable Costs' (defined by BSC Section G2).

These may be made <=20wd following the end of the Black Start event (unless the BSC Panel grants the Party an extension).

What are 'Avoidable Costs'?

*'G 2.1.2 ... the Panel shall determine, in its opinion, what is the amount of the **net costs of operating the BM Unit which would not have been incurred but for:***

- (a) the relevant changes in Exports and/or Imports: or*
- (b) **a black start instruction.***

'G 2.1.3 For the purposes of the Code, the "Avoidable Costs" shall be the amount determined by the Panel under paragraph 2.1.2 (which may for the avoidance of doubt be a negative amount, in a case where net costs were saved or revenues earned).'

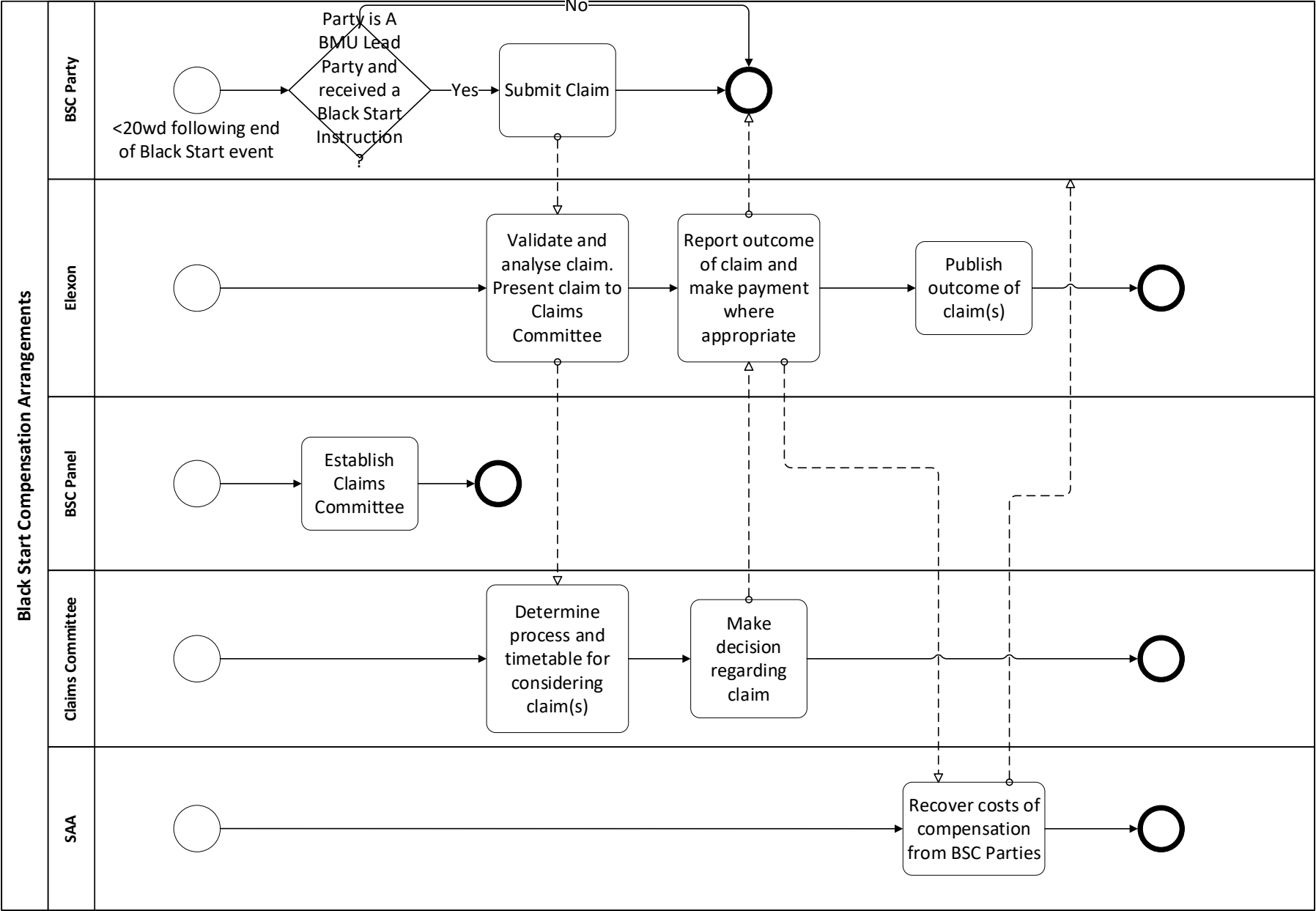
And Black Start Instructions?

'G 3.3.1C For the purposes of this paragraph 3.3, a "black start instruction" is:

- (a) in relation to any Settlement Period(s) which fall within both a Black Start Period and a Market Suspension Period, an instruction given by the NETSO pursuant to OC9.4.7.4, BC2.7 or BC2.9 of the Grid Code; **[i.e. any instruction by NETSO to any User]** or*

- (b) in relation to any Settlement Period(s) which fall within a Black Start Period but not within a Market Suspension Period, an instruction given by the NETSO pursuant to BC2.9.1.2(e)(i) of the Grid Code. **[i.e. instructions by NETSO to those affected/subject of an 'invoked Local Joint Restoration Plan']'***

Compensation – illustrative summary



DISTRIBUTED RESTART: POSSIBLE OPERATION

Nicholas Rubin, Design Authority

Possible operation of Distributed Restart

Distributed ReStart is an innovation project proving the possibility of bottom-up restoration to supplement the traditional transmission-led Black Start services.

‘Distribution Restoration’ will be provided by Distributed Energy Resources (DERs) who will be contracted as part of a feasible Distribution Restoration Zone (DRZ) consisting of a self-starting generator and additional top-up services.

DERs are expected to be providers that are registered **within a Supplier’s BMU** and **operated by non-BSC Parties**.

LDSOs are responsible for monitoring DRZs and dispatching them should NETSO instruct the LDSO to provide Distribution Restoration.

- Means and nature of communication – TBD
- Publication?

Composition and expected operation of DRZs is pre-determined in restoration plans.

Possible operation of Distributed Restart

How will DERs be paid?

Bilateral contracts will cover specific payments for:

- Availability – paid monthly
- Testing – conducted periodically

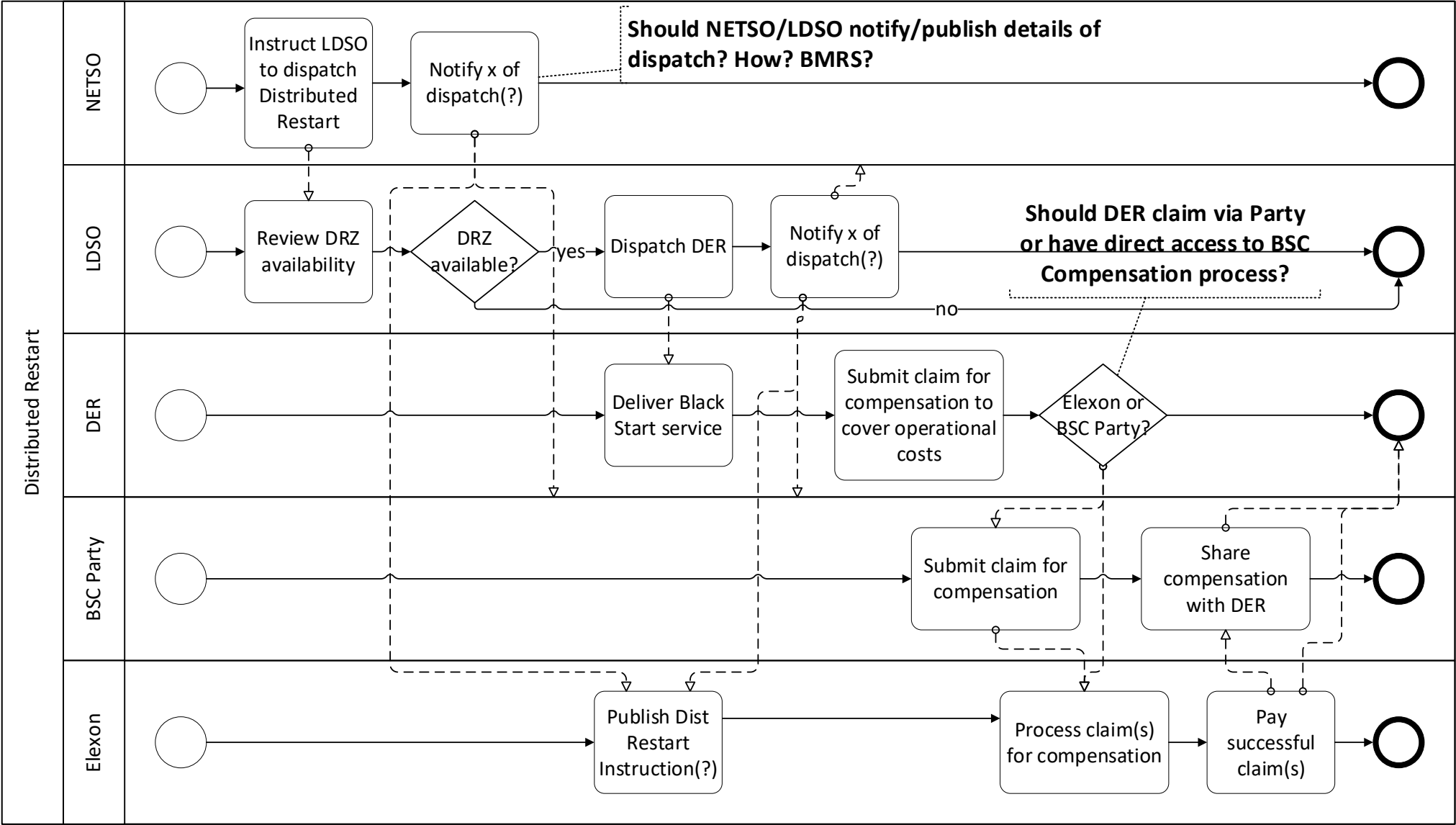
However...

- Delivery of Distribution Restoration during a Black Start event – **TBA** – hence Issue 100
 - These costs are not currently/intended to be covered by Grid Code, CUSC or Balancing Service Contract
 - NETSO considered BSC Compensation as place to start
 - BSC already provides a mechanism by which avoidable costs of responding to a Black Start Instruction may be compensated

To consider:

- Are Distribution Restoration operating costs ‘avoidable costs’?
 - What are a DER's likely costs?
- Is an instruction to deliver Distribution Restoration a Black Start Instruction?
 - Nb we expect NETSO to instruct LDSOs, who in turn instruct DER.

Distributed Restart – illustrative example of our understanding



AREAS TO CONSIDER AND OPTIONS

Nicholas Rubin, Design Authority

Areas to consider

In accordance with NGESO's Issue Proposal, we need to look at the following areas:

- How (existing) compensation arrangements should apply:
 - Where the DER is not a BSC Party and the plant is not in a dedicated BMU?
 - Where the service is provided by a technology type which does not use fuel, or if it is provided by storage (battery or pumped hydro) which would expend stored energy?
- The role of LDSOs, DERs in the E2E Black Start Process. In particular:
 - Communications/Interfaces between NETSO, LDSOs and DERs (and BSC Parties?) – also where DERs registered by Virtual Lead Parties
 - Sharing of information relating to (Distributed Restart) Black Start Instructions
 - Publication of information relating to (Distributed Restart) Black Start Instructions

Options: Compensation

- i) **Do nothing – there is no issue** – i.e. Distributed Restart providers are already compensated by virtue of their contracts and so there are no avoidable costs to claim.
- ii) **Do nothing – Lead Parties can already make claims and may include DER costs?**
 - Are DER operating costs ‘Avoidable Costs’? Should meaning be expanded?
 - DERs are dispatched by LDSOs not directly by NETSO – is this an instruction by NETSO and therefore a Black Start Instruction?
 - Could a Lead Party claim on behalf of a DER registered in their BMU?
 - *‘G 2.1.4 In determining what are the costs of operating a BM Unit and what such costs would not have been incurred (as provided in paragraph 2.1.2), the Panel shall have regard to the following: ...
(b) in the case of a BM Unit comprising premises of a Customer, the costs which are to be counted are the costs incurred by the Customer;’*
 - Would BSC Parties want to process a claim on behalf of DER? Would DER providers want BSC Parties acting on their behalf?
- iii) **Allow (specific) non-Parties to make claims**
 - Would likely require novel governance and interfaces to cater for non-Party
 - Interested party role for BSC Change may not be sufficient as this new process requires payment – question for legal
 - New financial interfaces as current financial interfaces are with Parties
 - May need rules to ensure exclusion of Distributed Restart from any Lead Party’s compensation – to avoid double counting.
 - Equivalent to ABSVD adjustment?
 - Use existing compensation forms and process?
- iv) **Compensation is paid by another means** – eg. Restoration Service contract or in accordance with CUSC?
 - DERs would have direct relationship with NETSO by virtue of bilateral contracts
 - Costs may be recovered through BSUOS like other Balancing Service costs

If DER operation is an ‘Avoidable Cost’ and due compensation, are the BSC’s compensation/avoidable costs principles still fit for purpose? Are there particular considerations for when calculating costs that are new/different to considerations for ‘normal’ generators?

Options: Interfaces, publication, inclusion in other Settlement processes

How will Distributed Restart be 'dispatched'?

- Our understanding is that this will be governed under the Grid Code
- i.e. NETSO instructs LDSOs who in turn instruct DERs

Is there a need for the BSC to describe these interfaces?

- Possibly to at least include/recognise them as being a Black Start Instruction?

Who and how should information about dispatched Distributed Restart be published? If at all?

- Responsibility – NETSO, LDSO and/or Elexon?
- Where – SONAR, BMRS...?
- Type of message
 - BOA – would only work if the DER is registered in a dedicated BMU
 - BSAD/ABSVD – seeing as Issue 100 is seeking to establish a means of compensation, any BSAD for DER would be unpriced until it's cost was determined through a compensation claim!
 - System Warning
 - Something else?

Should Distributed Restart be reported to Elexon like other Balancing Services so they can be included in System Price calculation (as BSAD) and accounted for in Parties' Imbalance calculations (as ABSVD)?



DISCUSSION



NEXT STEPS

Next steps

- Workgroup summary to be issued by 30 June 2022
- Doodle poll to be issued to seek availability for Workgroup meeting 2
- Post meeting actions to be addressed

MEETING CLOSE

ELEXON

THANK YOU

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24 June 2022