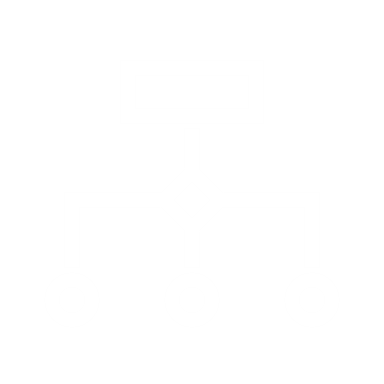
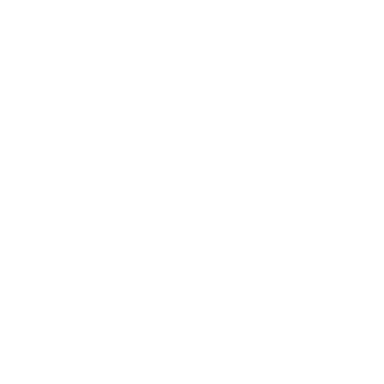
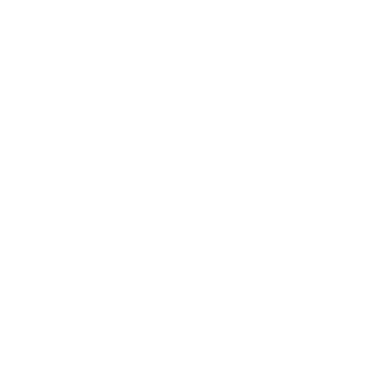
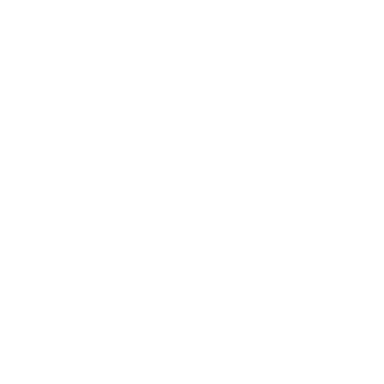
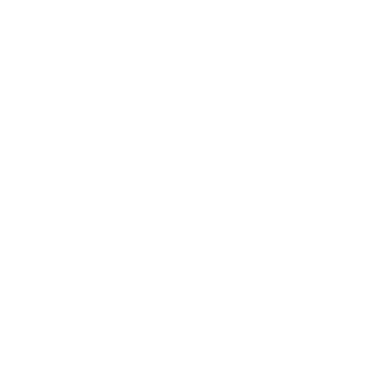
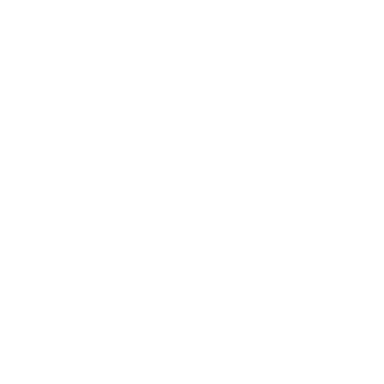


**XRN5531**

**Hydrogen Village Trial**



**High Level Solution Option**

**Impact Assessment Summary**

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| **Introduction** |
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| This **High Level Solution Option (HLSO) Impact Assessment Summary** is designed to provide DSC customers with the appropriate details to aid in understanding proposed Solution Options being put forward to the industry to satisfy customer requirements for the specified DSC Change Proposal (XRN).  This document aims to provide transparency in the analysis carried out to date by the CDSP and assist customers in making informed decisions around impacts to the industry, the CDSP and potential changes need to their own systems & processes as a result of the proposed Solution(s).  Please note that the details and cost estimates outlined within this document has a validity period of 6 months following the issue of the Solution Option Change Pack.  If you have any questions related to this HLSO, please contact the [uklink@xoserve.com](mailto:uklink@xoserve.com) box account in the first instance. |
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| **Target Audience** |
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| This High Level Solution Option (HLSO) Impact Assessment Summary is targeted to specific DSC Customers and industry parties shown below following analysis to date. It is advised that this document be reviewed in its’ entirety and parties provide the CDSP representations/feedback via the Change Pack consultation process.  However, it is also encouraged for ALL industry parties to review and where appropriate provide representations/feedback on potential impacts for the solution option(s) being proposed within this HLSO.  Please note that different solution options could impact different industry parties and in different ways, these are called out and referenced in the individual Solution Option sections within this document. |
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| * Gas Shippers * Distribution Network Operator (DNO) * Independent Gas Transporters (IGT) * Gas Suppliers * Meter Asset Manager (MAM) also referred to as Meter Equipment Manager (MEM) in the Retail Energy Code * Meter Asset Provider (MAP) * Performance Assurance Framework Administrator (PAFA) |
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| **Change Overview – XRN5531 Hydrogen Village Trial** |
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| As part of the progression towards Net Zero Cadent and Northern Gas Networks have been awarded funding by Ofgem to develop the design of a Hydrogen Village Trial. The aim of the trial is to repurpose an existing gas network to supply 100% hydrogen to end consumers.  Both Cadent and Northern Gas Networks have submitted proposals to Ofgem with a comprehensive design of their Hydrogen Village Trial. Each Distribution Network Operator has chosen a specific location for the trial to take place. Cadent has chosen Whitby in Ellesmere Port and Northern Gas Networks has chosen Redcar. From late 2025 and early 2026 up to 2,000 domestic and smaller industrial and commercial end consumers will be supplied with 100% hydrogen for an expected duration of 2 years. Hydrogen meters will be required to be installed, at all properties in the trial, by hydrogen trained engineers. To ensure the safety of this work the Distribution Network Operator will be responsible for the hydrogen meters including procuring, installing and maintenance for the duration of the trial.  As the natural gas pipework will be repurposed, end consumers will have the option to opt out of the trial by either converting to electricity (Northern Gas Networks) or converting to a new natural gas pipeline (Cadent).  Ofgem and the Department for Energy Security and Net Zero will be assessing the submitted proposals and are expected to make a decision before the end of 2023 on delivering Hydrogen Village Trial(s).  To support both Cadent and Northern Gas Networks proposals the CDSP has considered several possibilities to support billing and settlement accuracy for the period of the trial. Gas Shippers and Gas Suppliers were also invited to provide thoughts on four of them:   * A hydrogen Local Distribution Zone associated with each physical Local Distribution Zone * Calorific Value (to use the hydrogen Calorific Value when calculating energy) * Multiplication Factor * Conversion Factor (also known as Correction Factor)   Ofgem provided the direction that any billing and settlement solution should only meet the needs of the trial and not a future hydrogen rollout. Due to the impact, cost, and complexity of both the new hydrogen Local Distribution Zone and Calorific Value it has been decided not to pursue these any further.  Multiplication Factor  Separate to the Hydrogen Village Trial, the 100% Hydrogen Neighbourhood Trial H100 Fife is due to go live in 2024 and is being led by SGN. A settlement solution was approved under XRN5298 H100 Fife, supported by UNC modification 0799. The chosen solution is the use of a determined Multiplication Factor, which is maintained in Market Domain Data, and will be used in energy calculations to account for the difference in volume that is required for hydrogen to deliver the equivalent energy of natural gas. Changes to central systems were implemented in February 2023.  This solution has been assessed for its suitability in the Hydrogen Village Trial. There are two main challenges that would need to be overcome:  *Hydrogen ready meters* – hydrogen ready meters can flow both natural gas and hydrogen with a small configuration change required before a different gas flows. As the Multiplication Factor is assigned to a meter if a hydrogen ready meter flows natural gas it would still apply the determined Multiplication Factor. Cadent and Northern Gas Networks are working with the Retail Energy Code Company to identify a potential solution. This does not impact H100 Fife Hydrogen Neighbourhood Trial as they will not be using any hydrogen meters to flow natural gas.  *Smart metering data* - Multiplication Factor has been omitted from smart metering data which means that energy calculations (used for In Home Displays and Pay As You Go) will not use the determined Multiplication Factor. SGN, as part of the H100 Fife Hydrogen Neighbourhood Trial, is in the process of validating the solution(s) to address this and will be communicating with Gas Suppliers in due course.  An alternative solution, Conversion Factor, has been developed in case the H100 Fife Hydrogen Neighbourhood Trial approach is not compatible for the Hydrogen Village Trial.  Conversion Factor  The Conversion Factor is set out in the Gas (Calculation of Thermal Energy) Regulations and is used for the temperature, pressure, and compressibility of gas. For all Supply Meter Points whose Annual Quantity is 732,000 kWh or less a standard Conversion Factor of 1.02264 is applied. Supply Meter Points with an Annual Quantity greater than 732,000 kWh have a non-standard Conversion Factor.  A specific Conversion Factor would be calculated, agreed with Ofgem, and used in energy calculations to account for the difference in volume that is required for hydrogen to deliver the equivalent energy of natural gas.  As part of H100 Fife Hydrogen Neighbourhood Trial the use of a Conversion Factor was discounted due to the time it would take to change/derogate from the Gas (Calculation of Thermal Energy) Regulations. Further investigation into this has identified that a change/derogation may not be required – this is being validated between the Distribution Network Operators and Ofgem’s legal teams.  Please note that H100 Fife Hydrogen Neighbourhood Trial is continuing to work with industry to utilise the Multiplication Factor and the Pay As You Go solution.  Summary  Cadent and Northern Gas Networks are progressing with taking the Conversion Factor solution through to the end of Detailed Design whilst the challenges of Multiplication Factor are being investigated.  The High Level Solution Options and Detailed Design are being progressed before the decision on Hydrogen Village Trial. This will allow the Distribution Network Operator to make an informed decision as to whether Multiplication Factor or Conversion Factor will be used as the solution once this decision is made. |
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| **Useful Information** |
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| The below has been provided to aid customers understanding of the Change Proposal and/or any information that may be useful in reviewing this HLSO Impact Assessment Summary. |
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| * Link to [XRN5531 Hydrogen Village Trial](https://www.xoserve.com/change/customer-change-register/xrn-5531-hydrogen-village-trial/) change proposal * Link to [XRN5298 H100 Fife Change Documentation](https://www.xoserve.com/change/customer-change-register/xrn-5298-h100-fife-project-phase-1-initial-assessment/) * Link to [UNC Modification 0799](https://www.gasgovernance.co.uk/0799) (H100 Fife) * Link to more information on [Cadents Hydrogen Village Trial](https://hydrogenvillage.com/) * Link to more information on [Northern Gas Networks Hydrogen Village Trial](https://redcarhydrogencommunity.co.uk/) * Link to [UNC Modification 0681](https://www.gasgovernance.co.uk/0681) (this modification facilitated a process for CDSP to update the Conversion Factor. This process requires amending as part of the solution options for this change) |
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| **Customer Requirements Mapping** | | | |
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| The attached document shows the Customer Requirements that have been considered in the production of this HLSO Impact Assessment Summary. | | | |
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| **Proposed Solution Options** | | | |
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| The proposed High-Level Solution Option(s) that have been impact assessed to satisfy customer requirements are as follows: | | | |
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|  | | **1:** | **CDSP manages Conversion Factor** |
|  | | **2:** | **CDSP manages all metering data including Conversion Factor** |
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| Details of the impact assessment carried out for each proposed solution option has been outlined in subsequent sections of this document. If more than one solution is being proposed, sections will be repeated, however, they have been colour coded for ease of use. | | | |
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| **High Level Solution Comparison** |
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| Below provides a high-level comparison between the proposed Solution Option(s) to aid customers in appropriate decision making and representation responses. |
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| |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **Solution** | **CDSP**  **Impact** | **Customer Impact** | **Release Type** | **Upper**  **Estimate £** | **Customer Requirement** | | **1:** | High | High | Standalone / Major | £236k | 100% | | **2:** | Very High | High | Standalone / Major | £400k | 100% | |
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**1: CDSP manages Conversion Factor**

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| **Solution Overview** |
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| **CDSP manages Conversion Factor** |
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| The hydrogen Conversion Factors, provided by the Distribution Network Operator, will be applied to Supply Meter Points when both a hydrogen meter is installed in UK Link and the Supply Meter Point is taking part in the trial. The existing Network Project Flag will be used to identify Supply Meter Points taking part in the trial.  When a Supply Meter Point is no longer taking part in the trial the activity required is dependent on the type of meter installed:   * Hydrogen only meter – In line with existing rules the Gas Shipper will be required to send a RGMA file with the meter exchange details including the appropriate Conversion Factor to update UK Link. The CDSP will not make any changes to the Conversion Factor in this scenario. * Hydrogen ready meter - (therefore not requiring a meter exchange) CDSP will update the Conversion Factor to last appropriate non-hydrogen Conversion Factor. |
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| **Constituency Impact Overview** |
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| Below provides a high level view of impacts per DSC Customers and industry parties, more details and reasoning for such are outlined in the later sections.  Please note that the below is the view of the CDSP following analysis to date on the solution option being proposed. It is encouraged for representatives to carry out their own assessment and where possible provide feedback if they feel the below is not a true representation of the impacts that would be felt if the proposed solution option were to be progressed with and implemented. |
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| |  |  |  | | --- | --- | --- | | Gauge with solid fill  High | Gas Shippers  Gas Suppliers  Distribution Network Operator (DNO)  Central Data Service Provider (CDSP) |  | |  |  | | Speedometer Middle with solid fill  Medium | N/A | |  |  | | Speedometer Low with solid fill  Low | Independent Gas Transporters (IGT)  Meter Asset Manager (MAM)  Meter Asset Provider (MAP) | |
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| **Solution Impact Summary** | |
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| The below provides a high level summary of the proposed solution option, additional details for each are provided in subsequent sections. | |
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| CDSP Impact: | **High** |
| Customer Impact: | **High** |
| Release Type: | **Standalone or Major \*** |
| Cost Estimate: | **122,000 - 236,000 GBP** |
| Customer Requirement Coverage: | **100%** |
| \* Costs have been calculated based on the solution option being delivered within a standalone release. Cost savings may be realised if the solution option is delivered as part of a scheduled major release. | |

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| **Estimated Cost Breakdown** |
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| Estimated costs provided are indicative and based on high level analysis to date and may be subject to change if the solution moves further through change development. |
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| |  |  |  | | --- | --- | --- | | **Development / Implementation Costs** | | | | **Element** | **Lower** | **Upper** | | Design | 10,000 GBP | 20,000 GBP | | Delivery | 90,000 GBP | 180,000 GBP | | Contingency | 10,000 GBP | 20,000 GBP | | **Total** | **110,000 GBP** | **220,000 GBP** | |
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| |  |  |  | | --- | --- | --- | | **Ongoing Costs** | | | | **Element** | **Lower** | **Upper** | | Service & Operate | 12,000 GBP | 16,000 GBP | | Contracting & Assurance | - | - | | Other | - | - | | **Total** | **12,000 GBP** | **16,000 GBP** | |
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| **CDSP Technical Overview** |
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| The CDSP systems impacted by the proposed solution are outlined below with details on how they are affected and what is involved.  **UK Link**   1. Logic to validate and replace the Conversion Factor when a Supply Meter Point is assigned to the trial and a RGMA transaction is received installing a hydrogen only meter. The response file will be issued with the updated Conversion Factor. 2. A daily maintain program to update the Conversion Factor when the: 3. Supply Meter Point is assigned to the trial with a hydrogen ready meter installed and the Supply Meter Point is receiving hydrogen. 4. Supply Meter Point is assigned to the trial and the Annual Quantity is calculated that amends the Conversion Factor required (<=732,000 kWh or >732,000 kWh). 5. Supply Meter Point is no longer assigned to trial (opts out or the trial ends) with a hydrogen ready meter installed and the Supply Meter Point is no longer receiving hydrogen. 6. A new Conversion Factor mapping table to store hydrogen Conversion Factor values. 7. Creation of a new technical exception when the appropriate Conversion Factor cannot be determined. 8. Where the Conversion Factor is updated by the CDSP a meter exchange will be processed including estimating reads. An unsolicited file will be issued to Gas Shippers. 9. Updates to the T97 record within the .NRL file to populate the Correction\_Factor\_Required field as ‘N’ for Supply Meter Points in the trial. 10. Changes to Conversion Factor Amend program to ensure that a hydrogen Conversion Factor is not applied to Supply Meter Points no longer taking part in the trial.   **SAP BW/BO & SAP PO**   1. Changes to H100 Fife Hydrogen Neighbourhood Trial incorrect metering reports to include meters and Supply Meter Points in the Hydrogen Village Trial.   There are no system changes required to the following systems as part of this solution option   * AMT/EFT/Marketflow * Central Switching Service * Gas Enquiry Service * Data Discovery Platform (DDP) * Contact Management System (CMS) |
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| **Impacted / Consequential Processes** |
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| The industry processes that are impacted by the proposed solution are outlined below, which could include DSC and non-DSC provided services.  **RGMA**   * Any RGMA transaction to install a hydrogen meter when a Supply Meter Point is included in the trial will have the Conversion Factor amended, by CDSP, to the hydrogen Conversion Factor. * Where the CDSP updates a Conversion Factor without an inbound RGMA transaction a meter exchange will be created and processed in UK Link including estimating readings. An unsolicited response file will be issued to Gas Shippers containing the updated Conversion Factor and meter reads.   **.NRL File** (Annual Quantity Notification)   * The Correction\_Factor\_Required field within the T97 record will be populated as ‘N’ for Supply Meter Points assigned to the trial.   **CDSP updating Conversion Factor (MOD0681S)**   * Changes to ensure that a hydrogen Conversion Factor is not used once the trial has ended   **Reporting**   * The incorrect metering reporting, created for H100 Fife Hydrogen Neighbourhood Trial, will be updated to include meters and Supply Meter Points in the Hydrogen Village Trial.   **Reporting following a change of Gas Shipper and/or Gas Supplier**   * The report notifying Gas Shippers when there has been a switch, created for H100 Fife Hydrogen Neighbourhood Trial, will include Supply Meter Points in the Hydrogen Village Trial. No system changes are required to accommodate this.   **Gas Enquiry Service**   * The Online Portal will show Supply Meter Points that have been assigned to the Hydrogen Village Trial. No system changes are required to accommodate this.   **Gemini**   * A separate change is being raised/progressed so that a hydrogen Calorific Value can be accepted. Existing Business As Usual processes will be used to create a new site in Gemini.   **Flow Weighted Average Calorific Value Service**   * Existing Business As Usual processes will be used to create a new site in the Flow Weighted Average Calorific Value Service.   **Data Discovery Platform**   * Dashboards will show the hydrogen Conversion Factor when applied, in UK Link, to the Supply Meter Point. No system changes are required to accommodate this.   **Contact Management Service**   * Existing contacts may be used where an end consumer opts out of the trial and chooses to receive electricity.   **Non-Daily Metered Sampling**   * Supply Meter Points in the trial will be excluded from sampling processes.   **Monitoring Supply Meter Points in the trial**   * Supply Meter Points will be monitored before, during and after the trial by the Decarbonisation team. |
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| **Perceived Impacts to Industry Parties** |
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| Below provides customers with a steer on potential impacts to industry parties that are not directly linked to DSC. Please note that these are perceived impacts and are not fully known or is an extensive list.  We encourage all industry participants to review the contents within this document and make their own determinations on potential impacts as the CDSP would not have full visibility or understanding of such. |
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| These are the perceived impacts from the solution options in this document only. The Distribution Network Operator who will progress to a Hydrogen Village Trial may have a number of expectations from industry participants which will be set out and communicated, separate to this change, to relevant participants in due course.   * Gas Suppliers – need to use the relevant Conversion Factor when billing end consumers. This Conversion Factor will need to be updated in Smart Metering to ensure that In Home Displays are accurate as well as Pay As You Go charges. Gas Suppliers will need to identify who the Meter Asset Manager and Meter Asset Provider are and provide this to the Central Switching Service. * Meter Asset Managers – need to be aware that the hydrogen meter(s) who will be managed by the Distribution Network Operator (or their appointed Meter Asset Manager). |
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| **Assumptions** |
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| Below are any assumptions that have been made in the course of carrying out this High Level Solution Option (HLSO) Impact Assessment. |
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| |  |  |  | | --- | --- | --- | | **Ref** | **Assumption** | **Notes** | | A01 | The Distribution Network Operator will be the owner of the hydrogen meters for the duration of the trial (i.e., they will be the Meter Asset Provider or will instruct one on their behalf) | No CDSP changes are required to support this | | A02 | The Distribution Network Operator will be responsible for the hydrogen meters for the duration of the trial (i.e., they will be the Meter Asset Manager or will instruct one on their behalf) | No CDSP changes are required to support this | | A03 | There are no CDSP changes required specifically to support any IGTs operating in the trial area |  | | A04 | There are no CDSP changes required for end consumers opting out of the trial | Existing processes will be used if end consumers choose to receive electricity or natural gas | | A05 | All Supply Meter Points with an AQ <=732,000 kWh will have the same hydrogen Conversion Factor. Supply Meter Points with an AQ >732,000 kWh will have their own individual hydrogen Conversion Factor | All Conversion Factors used within the trial will be calculated and provided by the Distribution Network Operator (in agreement with Ofgem) | | A06 | Gas Shippers will be able to update the meter exchange reads created by CDSP using XRN5482 - Replacement of reads associated to a meter asset technical details change or update (RGMA) functionality |  | | A07 | The hydrogen Conversion Factors are in the same format as current Conversion Factors | Therefore, there is no impact to downstream processes including reporting and file formats | | A08 | Convertors will not be installed for Supply Meter Points in the trial |  | | A09 | CDSP will create a .UPD file to update a meter exchange in UK Link. An unsolicited .UPR response file will be issued to Gas Shippers |  | | A10 | At the end of the trial where a hydrogen ready meter is installed with an Annual Quantity greater than 732,000 kWh but there is no previous site-specific Conversion Factor, the standard Conversion Factor 1.02264 will be applied | Gas Shippers will identify and update UK Link with the appropriate Conversion Factor once known | | A11 | There are no changes required to the ‘Incorrect Conversion Factor’ reporting generated for the Performance Assurance Report Register | This report will not include any Supply Meter Points with a hydrogen Conversion Factor | | A12 | Existing processes will be used by the Meter Asset Manager to update Suppliers |  | |
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| **Dependencies/Dependents** |
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| Below are any dependencies for and against this Solution Option that have been made in the course of carrying out this High Level Solution Option (HLSO) Impact Assessment. |
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| |  |  |  | | --- | --- | --- | | **Ref** | **Dependency** | **Notes** | | D01 | Hydrogen Meter(s) used in the trial have to be added to Market Domain Data | The Distribution Network Operator will raise a change with the Retail Energy Code Company | | D02 | Distribution Network Operator to provide to the CDSP the Supply Meter Points taking part in the trial with their start and end dates, all Conversion Factors, and the meter details of the hydrogen meters | This information is required to support the solution option functionality | | D03 | Change to Gemini to accept a hydrogen Calorific Value | A change has been raised and is currently undergoing assessment | | D04  (Links to Risk  R02) | Shippers must provide the hydrogen meter details (or the non-hydrogen meter at the end of the trial) which will be subject to existing Business As Usual validations | Settlement accuracy is dependent on the correct metering information in UK Link | |
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| **Risks** |
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| Below are any risks that have been identified in the course of carrying out this High Level Solution Option (HLSO) Impact Assessment. |
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| |  |  |  | | --- | --- | --- | | **Ref** | **Risk** | **Mitigation** | | R01  (Links to Dependency D04) | Settlement will be calculated incorrectly if the hydrogen meter (or the non-hydrogen meter at the end of the trial) is not updated in UK Link by the Gas Shipper | Notify Gas Shippers when a non-hydrogen meter is installed for a Supply Meter Point taking part in the trial.  Notify Gas Shippers when a hydrogen meter is installed for a Supply Meter Point not taking part in the trial. | |
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| **Governance Approach** |
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| This change is funded by the Decarbonisation Investment Line. Whilst not funded through DSC Change the same governance procedures will be followed i.e., Solution Option and Detailed Design Change Pack consultations, Release scope.  A UNC modification will be raised, by the Distribution Network Operator, to progress with the agreed solution.  The Distribution Network Operator will be working with the Retail Energy Code Company to add the hydrogen meter(s) to Market Domain Data. An assessment will be concluded to identify if any further change is required i.e., to allow the Distribution Network Operator to be responsible for the hydrogen meter(s) for the duration of the trial.  No new service lines or amendments to existing service lines are expected. |
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| **Delivery Approach** |
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| This change can be delivered as either a Standalone or Major Release using waterfall methodology.  A potential release date has not been identified. |
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| **Additional Information** |
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| None |

**2: CDSP manages all metering data including Conversion Factor**

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| **Solution Overview** |
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| **CDSP manages all metering data including Conversion Factor** |
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| The existing Network Project Flag will be used to identifying Supply Meter Points taking part in the trial. Where a Supply Meter Point is assigned to the trial the CDSP will use the meter exchange details, submitted by the Meter Asset Manager to the Connections and Disconnections (C&D) store, to perform a meter exchange in UK Link.  Any RGMA files received by Gas Shippers prior to, during and following the Supply Meter Point taking part in the trial will be rejected using a new rejection code.  When a Supply Meter Point is no longer taking part in the trial the activity required is dependent on the type of meter installed:   * Hydrogen only meter – CDSP will process a meter exchange in UK Link. * Hydrogen ready meter – (therefore not requiring a meter exchange) CDSP will update the Conversion Factor to last appropriate non-hydrogen Conversion Factor. |
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| **Constituency Impact Overview** |
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| Below provides a high level view of impacts per DSC Customers and industry parties, more details and reasoning for such are outlined in the later sections.  Please note that the below is the view of the CDSP following analysis to date on the solution option being proposed. It is encouraged for representatives to carry out their own assessment and where possible provide feedback if they feel the below is not a true representation of the impacts that would be felt if the proposed solution option were to be progressed with and implemented. |
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| |  |  |  | | --- | --- | --- | | Gauge with solid fill  High | Gas Shippers  Gas Suppliers  Distribution Network Operator (DNO)  Central Data Service Provider (CDSP) |  | |  |  | | Speedometer Middle with solid fill  Medium | N/A | |  |  | | Speedometer Low with solid fill  Low | Independent Gas Transporters (IGT)  Meter Asset Manager (MAM)  Meter Asset Provider (MAP)  Performance Assurance Framework Administrator (PAFA) | |
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| **Solution Impact Summary** | |
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| The below provides a high level summary of the proposed solution option, additional details for each are provided in subsequent sections. | |
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| CDSP Impact: | **Very High** |
| Customer Impact: | **High** |
| Release Type: | **Standalone or Major \*** |
| Cost Estimate: | **232,000 - 400,000 GBP** |
| Customer Requirement Coverage: | **100%** |
| \* Costs have been calculated based on the solution option being delivered within a standalone release. Cost savings may be realised if the solution option is delivered as part of a scheduled major release. | |

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| **Estimated Cost Breakdown** |
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| Estimated costs provided are indicative and based on high level analysis to date and may be subject to change if the solution moves further through change development. |
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| |  |  |  | | --- | --- | --- | | **Development / Implementation Costs** | | | | **Element** | **Lower** | **Upper** | | Design | 20,000 GBP | 38,400 GBP | | Delivery | 180,000 GBP | 307,200 GBP | | Contingency | 20,000 GBP | 38,400 GBP | | **Total** | **220,000 GBP** | **384,000 GBP** | |
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| |  |  |  | | --- | --- | --- | | **Ongoing Costs** | | | | **Element** | **Lower** | **Upper** | | Service & Operate | 12,000 GBP | 16,000 GBP | | Contracting & Assurance | - | - | | Other | - | - | | **Total** | **12,000 GBP** | **16,000 GBP** | |
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| **CDSP Technical Overview** |
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| The CDSP systems impacted by the proposed solution are outlined below with details on how they are affected and what is involved.  **UK Link**   1. RGMA activity, received by the Gas Shippers, during the trial will be rejected with a new RGMA rejection code. 2. 3 new programs created to: 3. Identify and process meter exchange details from the Connections & Disconnections Store . 4. Update Conversion Factors for hydrogen ready meters at both the beginning and end of the trial. 5. Update a Conversion Factor when the Annual Quantity changes to above or below 732,000 kWh (<=732,000 kWh or >732,000 kWh). 6. Where the metering details and/or Conversion Factor is updated a meter exchange will be processed including estimating reads where required. An unsolicited response file will be issued to Gas Shippers. 7. Where the meter exchange details in the Connections & Disconnections store have not been received, or are incomplete, the Distribution Network Operator will provide the meter details via a new screen in Portal. 8. A new Conversion Factor mapping table to store trial Conversion Factor values. 9. A new technical exception when the appropriate Conversion Factor cannot be determined. 10. Updates to the T97 record within the .NRL file to populate the Correction\_Factor\_Required field as ‘N’ for Supply Meter Points in the trial. 11. Changes to Conversion Factor Amend program to ensure that a hydrogen Conversion Factor is not applied to Supply Meter Points no longer taking part in the trial.   **SAP BW/BO & SAP PO**   1. Changes to H100 Fife Hydrogen Neighbourhood Trial incorrect metering reports to include meters and Supply Meter Points in the Hydrogen Village Trial.   **AMT/IX/EFT**   1. Changes to allow the new RGMA rejection code   **Data Discovery Platform**   1. Changes to reflect the new RGMA code in Gas Shipper and Performance Assurance Framework Administrator (PAFA) dashboards. No changes are required to reflect the determined Conversion Factor.   There are no system changes required to the following systems as part of this solution option   * Central Switching Service * Gas Enquiry Service * Gemini |
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| **Impacted / Consequential Processes** |
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| The industry processes that are impacted by the proposed solution are outlined below, which could include DSC and non-DSC provided services.  **RGMA**   * Any RGMA transaction, received by a Gas Shipper, will be rejected with a new rejection code. * Where the metering details and/or Conversion Factor is updated a meter exchange will be processed in UK Link including estimating reads where required. An unsolicited response file will be issued to Gas Shippers.   **New Portal Screen**   * The Distribution Network Operator for the Hydrogen Village Trial will be notified when meter details metering details haven’t been received/are incomplete in the Connection and Disconnections store. The Distribution Network Operator will be required to provide the details via a new screen in Portal.   **.NRL File** (Annual Quantity Notification)   * The Correction\_Factor\_Required field within the T97 record will be populated as ‘N’ for Supply Meter Points assigned to the trial.   **CDSP updating Conversion Factor (MOD0681S)**   * Changes to ensure that a hydrogen Conversion Factor is not used once the trial has ended   **Reporting**   * The incorrect metering reporting, created for H100 Fife Hydrogen Neighbourhood Trial, will be updated to include meters and Supply Meter Points in the Hydrogen Village Trial.   **Reporting following a change of Gas Shipper and/or Gas Supplier**   * The report notifying Gas Shippers when there has been a switch, created for H100 Fife Hydrogen Neighbourhood Trial, will include Supply Meter Points in the Hydrogen Village Trial. No system changes are required to accommodate this.   **Gas Enquiry Service**   * The Online Portal will show Supply Meter Points that have been assigned to the Hydrogen Village Trial. No system changes are required to accommodate this.   **Gemini**   * A separate change is being raised/progressed so that a hydrogen Calorific Value can be accepted. Existing Business As Usual processes will be used to create a new site in Gemini.   **Flow Weighted Average Calorific Value Service**   * Existing Business As Usual processes will be used to create a new site in the Flow Weighted Average Calorific Value Service.   **Data Discovery Platform**   * Dashboards will show the hydrogen Conversion Factor when applied, in UK Link, to the Supply Meter Point. No system changes are required to accommodate this. * The new RGMA code will be added to Gas Shipper and Performance Assurance Framework Administrator (PAFA) dashboards.   **Contact Management Service**   * Existing contacts may be used where an end consumer opts out of the trial and chooses to receive electricity.   **Non-Daily Metered Sampling**   * Supply Meter Points in the trial will be excluded from sampling processes.   **Monitoring Supply Meter Points in the trial**   * Supply Meter Points will be monitored before, during and after the trial by the Decarbonisation team. |
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| **Perceived Impacts to Industry Parties** |
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| Below provides customers with a steer on potential impacts to industry parties that are not directly linked to DSC. Please note that these are perceived impacts and are not fully known or is an extensive list.  We encourage all industry participants to review the contents within this document and make their own determinations on potential impacts as the CDSP would not have full visibility or understanding of such. |
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| These are the perceived impacts from the solution options in this document only. The Distribution Network Operator who will progress to a Hydrogen Village Trial may have a number of expectations from industry participants which will be set out and communicated to relevant participants, separate to this change, in due course.   * Gas Suppliers – need to use the relevant Conversion Factor when billing end consumers. This Conversion Factor will need to be updated in Smart Metering to ensure that In Home Displays are accurate as well as Pay As You Go charges. Gas Suppliers will need to identify who the Meter Asset Manager and Meter Asset Provider are. Gas Suppliers may need to obtain metering details from their Gas Shipper to resolve any data discrepancies. * Meter Asset Managers – need to be aware that the hydrogen meter(s) who will be managed by Distribution Network Operator (or their appointed Meter Asset Manager). * Performance Assurance Framework Administrator – needs to be aware of the new RGMA rejection code and why it is being used. |
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| **Assumptions** |
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| Below are any assumptions that have been made in the course of carrying out this High Level Solution Option (HLSO) Impact Assessment. |
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| |  |  |  | | --- | --- | --- | | **Ref** | **Assumption** | **Notes** | | A01 | The Distribution Network Operator will be the owner of the hydrogen meters for the duration of the trial (i.e., they will be the Meter Asset Provider or will instruct one on their behalf) | No CDSP changes are required to support this | | A02 | The Distribution Network Operator will be responsible for the hydrogen meters for the duration of the trial (i.e., they will be the Meter Asset Manager or will instruct one on their behalf) | No CDSP changes are required to support this | | A03 | There are no CDSP changes required specifically to support any IGTs operating in the trial area |  | | A04 | There are no CDSP changes required for end consumers opting out of the trial | Existing processes will be used if end consumers choose to receive electricity or natural gas | | A05 | All Supply Meter Points with an AQ <=732,000 kWh will have the same hydrogen Conversion Factor. Supply Meter Points with an AQ >732,000 kWh will have their own individual hydrogen Conversion Factor | All Conversion Factors used within the trial will be calculated and provided by the Distribution Network Operator (in agreement with Ofgem) | | A06 | Gas Shippers will be able to update the meter exchange reads created by CDSP, using XRN5482 (Replacement of reads associated to a meter asset technical details change or update (RGMA)) functionality |  | | A07 | The hydrogen Conversion Factors are in the same format as current Conversion Factors | Therefore, there is no impact to downstream processes including reporting and file formats | | A08 | Convertors will not be installed for Supply Meter Points in the trial |  | | A09 | CDSP will create a .UPD file to update a meter exchange in UK Link. An unsolicited .UPR response file will be issued to Gas Shippers |  | | A10 | At the end of the trial where a hydrogen ready meter is installed with an Annual Quantity greater than 732,000 kWh but there is no previous site-specific Conversion Factor, the standard Conversion Factor 1.02264 will be applied | Gas Shippers will identify and update UK Link with the appropriate Conversion Factor once known | | A11 | Existing processes will be used by the Meter Asset Manager to update the Connections and Disconnections store and Suppliers. |  | | A12 | When the CDSP performs a meter exchange and the meter to be removed does not match what is held in UK Link, no changes will be made to the meter currently installed and the final read will be based on those details. |  | | A13 | RGMA transactions will be rejected for a defined period prior to the Supply Meter Point taking part in the trial. Once the trial has ended (or the end consumer opts out) RGMA transactions will continue to be rejected for a defined period. | The defined period is to allow the CDSP to update the meter exchange details.  The length of this period will be agreed with the Distribution Network Operator.  At the end of the defined period Gas Shippers will be able to update metering data, in line with Business As Usual validations, including where an appointment date is within the trial timeline. | | A14 | If the CDSP has been unable to update the metering details at the end of the defined period, the Gas Shipper will become responsible for updating metering details in UK Link. |  | | A15 | There are no changes required to the ‘Incorrect Conversion Factor’ reporting generated for the Performance Assurance Report Register | This report will not include any Supply Meter Points with a hydrogen Conversion Factor | |
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| **Dependencies/Dependents** |
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| Below are any dependencies for and against this Solution Option that have been made in the course of carrying out this High Level Solution Option (HLSO) Impact Assessment. |
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| |  |  |  | | --- | --- | --- | | **Ref** | **Dependency** | **Notes** | | D01 | Confirmation that using a determined Conversion Factor is in line with the Gas (Calculation of Thermal Energy) Regulations | Required to allow the CDSP and industry participants to use a hydrogen Conversion Factor | | D02 | Hydrogen Meter(s) used in the trial have to be added to Market Domain Data | The Distribution Network Operator will raise a change with the Retail Energy Code Company | | D03 | Distribution Network Operator to provide to the CDSP the Supply Meter Points taking part in the trial with their start and end dates, all Conversion Factors, and the meter details of the hydrogen meters | This information is required to support the solution option functionality | | D04 | Change to allow a hydrogen Calorific Value to be accepted into Gemini | This change has been raised and is currently undergoing assessment | |
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| **Risks** |
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| Below are any risks that have been identified in the course of carrying out this High Level Solution Option (HLSO) Impact Assessment. |
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| **Governance Approach** |
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| This change is funded by the Decarbonisation Investment Line. Whilst not funded through DSC Change the same process will be followed i.e., Solution Option and Detailed Design Change Pack consultations, Release scope.  A UNC modification will be raised, by the Distribution Network Operator, to progress with the agreed solution.  The Distribution Network Operator will be working with the Retail Energy Code Company to add the hydrogen meter(s) to Market Domain Data and add the new RGMA rejection code. An assessment will be concluded to identify if any further change is required i.e., to allow the Distribution Network Operator to be responsible for the hydrogen meter(s) for the duration of the trial.  No new service lines or amendments to existing service lines are expected. |
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| **Delivery Approach** |
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| This change can be delivered as either a Standalone or Major Release using waterfall methodology.  End to end testing, with the Distribution Network Operator, may be required for the new Portal screen functionality.  A potential release date has not been identified. |
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| **Additional Information** |
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| None |

**Appendix 1 - Discounted Solution Options**

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| **Solution Overview** |
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| **Gas Shipper maintains all metering data, including Conversation Factor, with limited CDSP changes** |
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| Gas Shippers would be responsible for maintaining metering details and the Conversion Factor in UK Link using existing RGMA processes.  Changes would be made, in CDSP systems:   * Updates to the T97 record within the .NRL file to populate the Correction\_Factor\_Required field as ‘N’ for Supply Meter Points in the trial. * Changes to Conversion Factor Amend program to ensure that a hydrogen Conversion Factor is not applied to Supply Meter Points no longer taking part in the trial. * Changes to H100 Fife Hydrogen Neighborhood Trial incorrect metering reports to include meters and Supply Meter Points in the Hydrogen Village Trial. A further enhancement will be made to notify a change in the Annual Quantity resulting in a different Conversion Factor being required. |
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| **Discounted Justification** |
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| The Distribution Network Operator is responsible for metering during the trial and has to ensure that there is a billing and settlement solution that meets their objectives. If Gas Shippers maintain the Conversion Factor the Distribution Network Operator cannot evidence that they have fulfilled their obligations. |
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**Appendix 2 - Glossary**

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| **Glossary** |
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| |  |  | | --- | --- | | **Term/Acronym** | **Definition** | | RGMA | Review of Gas Metering Arrangements | | CDSP | Central Data Service Provider | | UNC | Uniform Network Code | | MAM | Meter Asset Manager also referred to as Meter Equipment Manager (MEM) in the Retail Energy Code | |
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**Version Control**

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| **Document** |
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| |  |  |  |  |  | | --- | --- | --- | --- | --- | | **#** | **Date** | **Author** | **Status** | **Update** | | 1.0 | 12/05/2023 | Xoserve | Approved | Approved version baselined | |  |  |  |  |  | |
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| **Template** |
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| |  |  |  |  |  | | --- | --- | --- | --- | --- | | **#** | **Date** | **Author** | **Status** | **Update** | | 1.0 | 01 Apr 23 | Simon Harris | Live | Baselined HLSO Template. | |  |  |  |  |  | |
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