

XRN4772 - Composite Weather Variable (CWV) Improvements

Capture Document

Version 1 Approved

Proposed Change

Summary	<p>UNC Modification 0659 was proposed by Eon to require that solar radiation and precipitation values be considered as a weather variable in order to improve the accuracy of the Composite Weather Variables (CWV). At this time forecast and actual temperature and wind speed are considered by the CWV calculation.</p> <p>By considering these additional variables it is expected that the accuracy of NDM gas nominations and allocations will improve which will have consequential benefits to the gas balancing regime managed within UK Link Gemini.</p> <p>Additional functional changes are to be considered within the scope of this Change Proposal to facilitate future developments in the Composite Weather Variables requested by DESC.</p>
Background/ Change Details	<p>Modification 0659 was raised to oblige the CDSP to consider two new data items to improve the accuracy of the Composite Weather Variable (CWV). Whilst this modification may be subsequently withdrawn the principles contained in the modification are proposed to be implemented via this Change Proposal XRN4772.</p> <p>The Composite Weather Variable is an essential data item used within Demand Estimation and is designed to produce a linear relationship between weather (CWV) and gas demand. The CWV is required to support the NDM algorithm which calculates forecast NDM demand (Nominations) and actual NDM demand (Allocations).</p> <p>The data currently considered in the CWV is:</p> <ul style="list-style-type: none"> • Temperature readings taken/forecasted every 2 hours. • Wind speed readings taken/forecasted every 4 hours <p>The data to be captured is the following using existing agreements (as per 0659):</p> <ul style="list-style-type: none"> • Solar Radiation in j/cm2 for each weather station • Precipitation in mm for each weather station <p>The CDSP currently receive the existing weather variables from the Weather Service Provider in:</p> <ul style="list-style-type: none"> - 4 daily files containing forecast weather data (for today and tomorrow) - 1 daily file containing actual weather data (for the previous day) <p>There are no proposals to change the timings or frequency of the delivery of forecast or actual weather data.</p> <p>Every five years DESC and the CDSP assess the Composite Weather Variable formula and associated parameters, and in conjunction with DESC consider refinements and improvements that will prevail for the following five years. Detail of the analysis to be conducted is not described in this capture document as it is expected that the 'business as usual' process to engage with DESC will be conducted and this document should not prejudice this process. The analysis effort is included within the CDSP planned activities, however the Demand Estimation team at Xoserve have a number of systems that support CWV optimisation and the SNCWV review processes.</p> <p>These will require amendments to reflect this change which fall into two categories.</p> <ol style="list-style-type: none"> a) There is a need to store additional weather data items and history so that they can be used. b) Application of these data items in CWV calculation and optimisation routines. <p>The extent of the changes in b) will vary dependent on the decision from DESC and how these new weather data items will be used in the future CWV formula. As a</p>

	<p>consequence, we have included some effort for these changes within this Change Proposal and this is factored into the high end ROM cost.</p> <p>It is recommended this is first developed by DESC rather than DSG due to the technical nature of the requirements and this XRN will evolve with at DESCs request, ensuring change governance is adhered to.</p>
<p>Reason(s) for proposed change</p>	<p>The following was extracted from 'Why Change' summary within UNC Modification 0659 (v3 6th September 2018):</p> <p>"The benefit of making this change would be improvements to nominations and subsequently reconciliation because the profiled volume would be closer to the actual consumer consumption. It is also anticipated that Unidentified Gas (UIG) would be less volatile as a result, making energy purchasing less volatile for all Shippers. It is expected that the benefits of improving nominations ahead of and on the day, and reconciliation after close out would outweigh any costs from this revised approach.</p> <p>The proposed amendments would also improve the shaping of the EUC band profiles. There could be different shapes per profile, each being more reflective of the actual usage of the site. "</p>
<p>In Scope</p>	<p>Assuming that the DESC analysis concludes that these weather variables need to be considered this XRN is seeking to:</p> <ol style="list-style-type: none"> a. Ensure that the CDSP obtain the additional weather variables, either directly from a Weather Service Provider (WSP), or extend the existing dataset provided by the WSP under contract to the Distribution Networks. The direct contracting model between the CDSP and WSP is expected to be required. b. Amend the CWV calculation within UK Link systems. The exact future formula is not known at this time and will be defined following the period of analysis and consultation with Demand Estimation Sub Committee (DESC). c. Create the mechanism in which the solar radiation and precipitation values will be loaded into the UK Link system. <p>It is further anticipated that the following changes will be beneficial to be considered within the scope of this XRN in order to reflect the impact of these weather variables to gas consumption:</p> <ol style="list-style-type: none"> d. Amend the reporting frequency which data is obtained for existing weather variables to hourly. e. Amend the weightings within the calculation against which these weather variables are applied. Once received into the system, the readings received in these files are weighted via a percentage which varies depending on the time of day that the reading was taken. This is to determine how much it will influence the final CWV figure (weather readings taken in the middle of the night tend to have less of an impact on gas demand than readings taken in the morning, for example). These percentage weightings are not readily configurable by the user. <p>Inclusion of these changes within the scope of XRN4772 will be determined in conjunction with DESC and the CDSP demonstrating the value of them. Changes d and e are included within the high end ROM estimate.</p>
<p>Out of Scope</p>	<ol style="list-style-type: none"> a. In conjunction with the Demand Estimation Sub Committee (DESC), the CDSP reviews the CWV formula every 5 years. This work is scheduled to be conducted with DESC in 2019. The historic data necessary to undertake this analysis – i.e. solar radiation and precipitation values – has been obtained separately by the CDSP so is not included within the scope of this change. b. Performing the analysis to determine how these new weather variables impact the CWV. This is accounted for within operational business plans. Where additional effort is necessary above this effort this will be considered within this CP (And has been accounted for within the UNC modification 0659 ROM).

	<ul style="list-style-type: none"> c. There are no proposals to change the timings or frequency of the delivery of forecast or actual weather data. d. Amendment to the structure of the CWV data. e. Changes to notification methods to UK Link Users of the CWV data.
Benefits of change	As articulated above in 'Reason(s) for Proposed Change'.
Change Priority Assessment	<input type="checkbox"/> High <input checked="" type="checkbox"/> Medium <input type="checkbox"/> Low <input type="checkbox"/> Unknown
Change Governance Requirements	DSG have reviewed the scoring of this change. DSC Change Management Committee have referred the change to DESC to review the CP and proposed that the Capture document also be reviewed by this group.

High Level Solution Option(s)

High Level Solution Option(s)	<p>It is expected that the existing forecast and actual weather variable files received from the Weather Service Provider, FWV and AWW respectively, be modified to provide the data directly to UK Link systems.</p> <p>The UK Link system currently holds the calculation that will need to be amended such that the revised values be passed to the downstream processes that utilise CWV data.</p> <p>The format of the CWV values are not expected to change therefore the communication of the CWV to users will continue via the National Grid Data Item explorer.</p>
Preferred Option (If known)	<p>A single option has been identified to amend the existing means that data is loaded to UK Link systems to be used in the CWV calculation process.</p>
Impacted Systems	<p>It is expected that the UK Link system will be impacted in the following ways:</p> <p>UK Link System Application (SAP-ISU):</p> <ul style="list-style-type: none"> • The AWW and FWV file format will be modified to include values for solar radiation and precipitation for pre-defined intervals. S06 file will be modified to include new weather parameters which are being shared by Demand Estimation team. This will impact to the batch uploading AWW and FWV files that are used in the process of CWV calculations. It will result in modification of table structure in ISU and downstream calculations. PO modifications will be required for AWW and FWV (4 interfaces) to include new validations. • The new weather variables will be available in the UK Link system Application (SAP ISU) and therefore the program that performs the CWV calculation will need to be updated to account for the additional data. • A new interface file will be introduced to provide the weightages required for all 4 parameters like -wind, temperature, solar radiation and precipitation. A new batch job will be built to store the data in ISU and processing will take place in ISU. Changes are required in PO to include the new proposed file interface. <p>Business Warehouse:</p> <p>It is assumed that all new weather variables and parameters are required in BW for reporting purpose. Hence extraction job modification, table restructuring would be required to include new parameters. Downstream BW changes and BW reporting changes/ new reports would be required.</p> <p>Systems not expected to be impacted:</p> <p>Gemini:</p> <p><i>It is anticipated that there will be no impacts to the Gemini. Although the CWV is used as an input into Gemini, it is assumed that this change will produce a more accurate</i></p>

	<p>and refined figure that will be fed into Gemini with no downstream process impacts.</p> <p>UK Link User External Interfaces:</p> <p>The AWV and FWV file would need to be modified so that they can include the new data items. These are files provided to the CDSP by the weather service provider so there would be no impact on industry participants.</p>
High Level Cost Assessment & likely funding arrangements	<p>A ROM has been produced for UNC Modification 0659. The scope of the ROM covered the scope of the change described within this CP.</p> <p>The ROM indicated that development costs were in the range of £50k-130k, with additional operational costs of between £0-25k.</p> <p>The ROM articulated that the DSC Service Areas Impacted was 15. Demand Estimation. This attracts funding of Shipper User – 50% / DN Operator – 50%.</p>
Governance meetings & outcomes	<p>The Demand Estimation Sub Committee (DESC) assesses the Composite Weather Variable (CWV) Factors / Seasonal Normal Demand information every five years. The next review is due to take effect on UK Link systems on 1st October 2020. Consequently, the analysis will be discussed with DESC from Q4 2018.</p> <p>DESC will ratify the analysis with the UNCC as necessary.</p>
Recommended Release type	<p>It is expected that due to the scale of change that this will need to be included within a Major UK Link Release. Impacts to UK Link Users will be limited so this may not be mandated by external Users.</p>
Testing Approach	<p>Amendment to CWV values are normally conducted as a value set change without formal implementation of change to UK Link Users. This typically happens every 5 years. Whilst the change for 2020 is expected to amend the calculation more fundamentally than normal, the output of the calculation will be in the expected format. Consequently a market trials period is not expected.</p>
Training Approach	<p>DESC have suitable knowledge levels to assess the analysis outcomes.</p> <p>It is recommended that existing materials are reviewed to ensure that they reflect revised weather factors considered within the CWV, and the consequential impacts to downstream processes.</p>

Business Requirements

No	Actor (As)	Requirement Description (I want to...)	Rationale (So that...)	Acceptance Criteria	Priority	Source	Status
FR01	Xoserve	I want to obtain readings associated additional weather data items from a Weather Service Provider	So that they can be utilised by the Composite Weather Variable calculation	<p>Forecast readings for Solar Radiation and Precipitation are received four times a day</p> <p>Actual readings for Solar Radiation and Precipitation are received once a day. Readings cover the end of previous day and start of current day</p>	Must	Mark Perry	Business Approved
FR02	Xoserve	I want to have a weather station/s providing readings associated with the additional weather data items assigned to each LDZ	So that the we ensure an accurate Composite Weather Variable figure is produced for each LDZ	<p>We have weather stations assigned to each LDZ that provide Solar Radiation and Precipitation readings</p> <p>Individual weather stations can provide weather data for more than one LDZ</p> <p>Readings for Solar Radiation and Precipitation for each LDZ don't need to be received from the same weather station</p>	Must	Mark Perry	Business Approved
FR03	Xoserve	I want the UK Link System Application system to be capable of receiving readings associated with the additional weather data items	So that they can be utilised by the Composite Weather Variable calculation	Readings for Solar Radiation and Precipitation received four times a day for forecast data and once a day for actual weather data are accepted into the UK Link Application	Must	Mark Perry	Business Approved

FR04	Xoserve	I want the readings associated with the additional weather data items to be presented in a format that allows them to be accepted by the UK Link System Application	So that they can be utilised by the Composite Weather Variable calculation	Readings for Solar Radiation and Precipitation received four times a day for forecast data and once a day for actual weather data are accepted into the UK Link Application	Must	Mark Perry	Business Approved
FR05	Xoserve	I want the UK Link System Application to be capable of storing the accepted readings associated with the additional weather data items	So that they are available to be utilised by the Composite Weather Variable calculation	Readings for Solar Radiation and Precipitation to be stored within the UK Link Application and utilised by the Composite Weather Variable calculation	Must	Mark Perry	Business Approved
FR06	Xoserve	I want weightings to be applied against each reading associated with the new weather data items	So it can be determined how much of an impact each reading will have on the final Composite Weather Variable calculation	A weighting is applied to each reading for Solar Radiation and Precipitation that determines how much of an impact it will have on the CWV calculation	Must	Mark Perry	Business Approved
FR07	Xoserve	I want the weightings applied against each reading associated with the new weather data items to be amendable without the need for a formal system change	So that the weighting can be customised simply and easily should they need to be	The weightings for each weather data parameter can be updated via an interface file or through a manual datafix	Should	Mark Perry	Business Approved
FR08	Xoserve	I want to amended the formula for calculating the Composite Weather Variable to include parameters that utilise the new weather data items (exact formula to be specified following a period of analysis)	So that the Composite Weather Variable calculation produces a result that more accurately reflects gas demand each day	The composite Weather Variable calculation incorporates weather parameters for Solar Radiation and Precipitation	Must	Mark Perry	Business Approved
FR09	Xoserve	I want to the UK Link System to be capable of receiving readings for all of the data items (not just the new ones) taken at hourly intervals (currently 2 or 4 hourly intervals depending on the data item)	So that we have a more accurate understanding of the weather for each day resulting in a more accurate Composite Weather Variable figure being calculated	Readings associated with all weather data items are received into the UK Link Application Readings still to be received four times a day for forecast data and once a day for actual weather data	Could	Mark Perry	Business Approved

FR10	Xoserve	I want the Composite Weather Variable calculation to provide the Composite Weather Variable data to other downstream processes in the format that it is in currently	So that downstream processes or systems do not need to be amended to manage data in a different format	The final Composite Weather Variable value is produced in exactly the same format and as it is today No change to Gemini is required	Must	Mark Perry	Business Approved
FR11	Xoserve	I want the Composite Weather Variable calculation to provide the Composite Weather Variable data to other downstream processes to the timings that it does currently	So that downstream processes or systems do not need to be amended to manage data received at different timings	The final Composite Weather Variable value is produced to the same timings as it is currently No change to Gemini is required	Must	Mark Perry	Business Approved
FR12	Xoserve	I want to be able to report on all the data held against each weather data item (not just the new ones)	So that the data can be easily analysed	It is possible to report on all the weather data items and the data recorded against them	Must	Mark Perry	Business Approved
FR13	Xoserve	I want these changes to be implemented prior to 1st October 2020	So that new Composite Weather Variable calculation is in place for the next period (2020-2025)	The UK Link Application uses the New Weather Variable formula to calculate the CWV on and beyond 1st October 2020	Must	Mark Perry	Business Approved

RAID log

Risks

- No particular risks are identified at this time.

Issues

- No issues are identified at this time.

Assumptions

- Any changes in the approach to the solution may impact the overall costs of the change.
- Inclusion of any new requirement or modification of the requirements will change the cost.
- It is assumed that there are no impacts to Gemini as AIA and CWF files remained unaffected. However, integration testing is required to ensure no impacts.
- New weather parameters are required in BW for reporting purposes. Hence BW changes have been scoped in.
- The resources for the analysis undertaken by the CDSP in support of the DESC review is considered as 'business as usual' activity so is not factored into the bottom end costs quoted in the ROM. However, if it becomes apparent that a larger piece of work is required than has been accounted for within the Business Plan then this could become an additional cost. This has been factored into the high end estimate.
- DESC are due to complete its review of the CWV formula during 2019, the conclusions from this exercise will inform the changes needed in SAP-ISU and/or any new weather data contracts.
- No changes are expected to the Uniform Network Code itself. Any changes necessary to the UNC Related Documents (for example, the NDM Demand Estimation Methodology) will be identified and executed by DESC.
- The direct contracting model between the CDSP and WSP is expected to be required in order for the CDSP to obtain the weather variable data.

Dependencies

- DESC are due to complete its review of the CWV formula during 2019, the conclusions from this exercise will inform the changes needed in SAP-ISU and/or any new weather data contracts.

Constraints

- It is assumed that there are no file format changes to UK Link Users but it is assumed that Users will expect that this change is included within a major release as Users will need to include the revised CWV values within their systems.
- Shipper Users have indicated that the change should be implemented outside of the Winter Period.
- This change needs to take effect in UK Link systems with effect from 1st October 2020 which is when the next Cumulative Weather Variable review is due to take effect from. Sufficient design, build and test time needs to be afforded between the conclusion of the DESC review and implementation.

Document version control

Version	Date	Author	Status	Comments
0.1	25 th October 2018	DA	Draft	Internal version for discussion.
1	31 st October 2018	DA	Approved	All comments and requirements incorporated.

Template version control

Version	Date	Author	Status	Comments
0.1	23/04/2018	Alison Cross	Draft	Template created from M Number Capture document
0.2	25/04/2018	Alison Cross	Sent for review	Updated with reference to other previously used templates
0.3	15/06/2018	Alison Cross	Approved	Updated training approach re Gavin attending capture.
0.4	28/06/2018	Alison Cross	Sent for review/ Made current	Updated Change Governance to read Change governance requirements and added new section to record Governance meetings and outcomes. Updated instruction section Added Recommended release type.