MHHS PROGRAMME
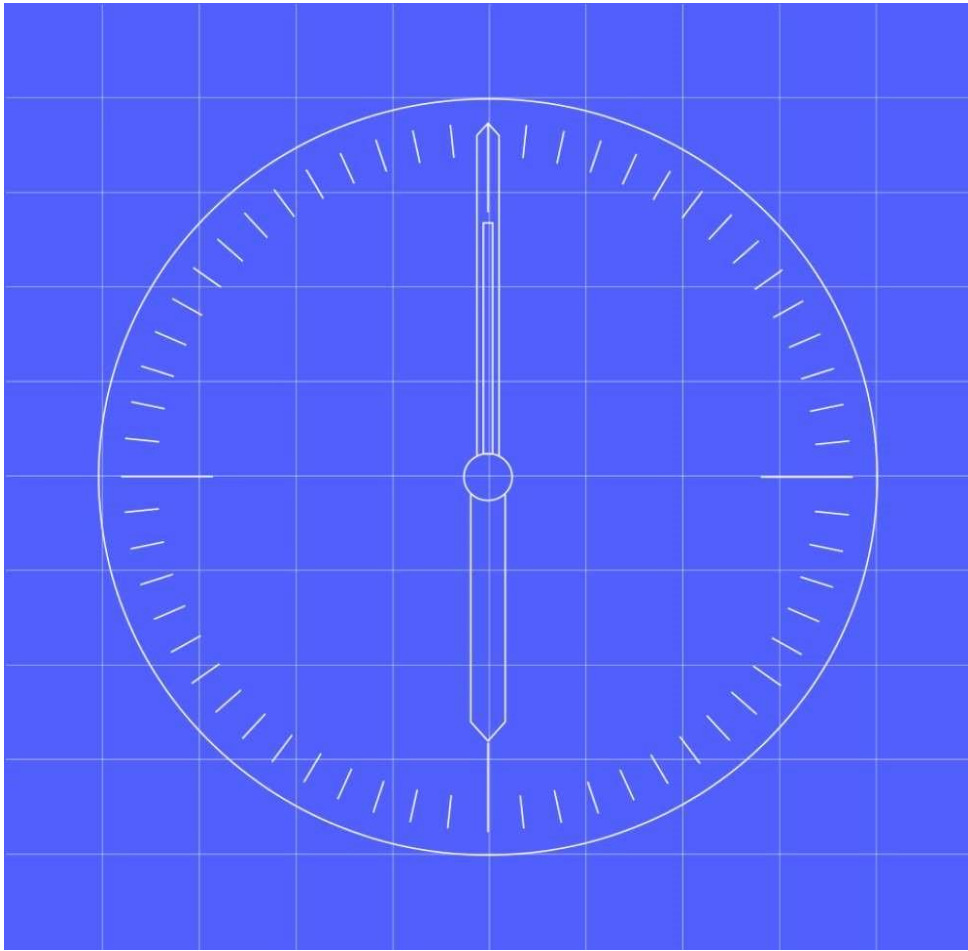Industry-led, Elexon facilitated

MHHS Interface-005 Use Case Guide –

Please note this is a supplementary document to DES-138 – Interface Catalogue

Version 1.3   04/07/2023

Contents

1.   Background

1.1

The implementation of Market-wide Half-hourly Settlement (MHHS) sees the introduction of a new suite of Market Messages to support the MHHS Design, replacing some or all of the previous D-Flows used to communicate business process events and share market data between participants.

1.2   The MMHS Design Team have created a series of documents which detail the nature of the new MHHS Design. These include Business Process Maps, Business Process Descriptions, and Interface Document encompassing a Data Catalogue and an End-to-End Architecture document.

1.3   It is recommended that readers familiarise themselves with these documents, in particular the Interface Document and End-to-End Architecture document in order to assist and support their understanding of the content of this document.

1.4   The most up-to-date set of MHHS Documentation can be found on the MHHS Website using the link: https://www.mhhsprogramme.co.uk/design/design-artefacts

The design and operation of the IF-005 interface assumes that there is no existing duplication of MPAN – Meter ID combinations (i.e. no duplication/overlap of [active] Meter ID's for a given MPAN) within the *existing* data held within the Registration Service. Steps should be taken by each Registration Service to ensure this is the case (and a resolution deployed) as part of MHHS Transition activity. The validation rules implemented alongside IF-005 will ensure that there is no duplication of active MPAN – Meter IDs moving forward.

2.   Purpose

2.1   The purpose of this document is to outline the key Use Cases for MHHS Interface 005 (IF-005) 'Metering Service MTD Update to Registration', and provide interface content examples for those use cases.

2.2   IF-005 is attempting to replicate the meter asset installation/removal and exchange functionality delivered by the D149/150/268 currently; and the meter history amendment functionality currently realised through the D0312.

2.3   This document is intended to compliment the MHHS Interface Document & End-to-End Architecture documents.

2.4   The scenarios and examples outlined in this document are intended to be illustrative and not exhaustive.

2.5   This document describes the low level interface content as of December 2022, following the design baselining decision taken by the Design Approval Group (DAG) in November 2022. Whilst the general usage and functionality is *not expected* to change, it is possible that the low level JSON structures and/or validation rules described in this document may have been refined since the time of writing. Therefore readers should also refer to the most recently published 'MHHS Interface Document' in order to validate the current message structure and validation rules.

2.6   The JSON examples in this document have been manually constructed and edited to suit the usage examples, so may not be syntactically correct.

2.7   In the examples, Install and Remove Dates in the case of meter exchanges, are shown as being the same date – it is accepted that many participant systems will have the constraint / adopt the convention of setting the removal date to being the day prior to the Installation Date.

3.   IF-005 Overview

3.1   The general use case for IF-005 is to allow the currently appointed Metering Service to maintain the 'Meter History' for an MPAN held in the Registration Service, which if accepted is then communicated to other interested MHHS Participants via PUB-006 'Notification of Metering Service MTD Update to Registration'.

3.2   It is only the 'currently appointed' Metering Service that may make updates to the current and/or historic metering history stored in the Registration Service. The two exceptions to this rule are:

a.   situation when the previously appointed Metering Service may for a period of 10 working days notify an Install/Exchange or Removal (but not a history update) which occurred within their period of ownership, but where the de-appointment occurred prior to the metering Service being able to issue the metering activity notification.

b.   situation of a 'Change of Segment' i.e where a Metering Service has an accepted/prospective appointment with reason code of 'SEG' (in which circumstance the metering activity transaction needs to be processed prior to the MS Appointment, but that prospective appointment has an effective date of (or prior too) the date of the physical metering activity).   Add Install/Exchange/Remove

3.3   In relation to the maintenance of historic meter history, this is responsibility of the 'current' Metering Service. It is expected where issues/queries around the accuracy of that history arise, the current Metering Service will make 'best endeavours' to liaise with interested participants i.e. the Supplier & previous Metering Service(s) as required, before making updates to the Meter History at an MPAN.

Following participant discussion at Design Review Group (DRG), a decision was made to restrict the update of MAP history to the amendment of the current/most recent MAP.

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4.   IF-005 Event Codes

4.1   IF-005 currently has six event codes this can be grouped together into two main use case types:

IF-005 Event Code Usage Summary		
Day-to-Day / BAU Transactions	[MeterInstall]	Allows the 'addition' of a new meter, where the install date of the meter is within the current Metering Service's period of ownership
	[MeterRemoval]	Allows the 'removal' of a currently active meter, where the removal date of the meter is within the current Metering Service's period of ownership
	[MeterExchange]	Allows for the 'exchange' i.e. simultaneous removal of currently active meter, and installation of a new meter, within the current Metering Service's period of ownership
History Maintenance Transactions	[MeterUpdate]	Allows currently appointed Metering Service to amend the details associated with a currently installed meter.
	[MeterHistoryUpdate]	Allows currently appointed Metering Service to amend the meter history and/or the details associated with a previous installed, but now removed meter.

5. Day-to-Day / BAU Events

5.1   It is anticipated that these will be by far the most commonly used transactions. The current validation rules associated with these transactions are described in detail in the MHHS Interface Document, however, the general validation principles, applied by the Registration Service, to these transactions are as follows:

- Can only be submitted by the currently appointed Metering Service; or for a period of [10] days following the end date of a previously appointed Metering Service to allow for delayed or very recent metering activity; or a Metering Service with a prospective appointment type of 'SEG' (therefore assumed to be supporting 'Change of Segment' activity)

- Metering activity, as determined by the Install / Remove Date(s) takes place within the Metering Services period of ownership (or proposed period of ownership in the case of a prospective SEG appointment)

- Metering activity, as determined by the Install /Remove Date(s), cannot have taken place in the future

- Metering activity, as determined by the Install Date, must have taken place on or between the MPAN Creation and MPAN Disconnection Dates (validation allows for meter removal at a point following Disconnection if required)

- The installation of a meter, either via standalone [MeterInstall] or [MeterExchange] event, is not permitted where the Meter Serial Number / Meter ID of the incoming meter exactly matches that of an already installed meter (i.e. moving forward it shall not be possible for two meters with the same 'Meter ID' to be installed, at the same time for the same MPAN. Historic instances where this may have occurred in the past are dealt with as part of the [MeterHistoryUpdate] event]

- The MAP for newly installed meters must be provided, must be valid per ISD, and must become effective, in alignment with the Meter Installation Date.

- Note - there is *no validation* in relation to 'Meter Type' and the Market Segment/type of the Metering Service appointed, as this may at best cause substantial delay; or at worse entirely prevent the update of metering information so as to accurately describe and record that metering actually found on site. For example, if a Smart Metering Service were to discover an advanced meter in place (or vice versa). However, the 'Meter Type' used should still be valid per Industry Standing Data (ISD).

6. [MeterInstall] Usage & Example

6.1 As outlined above, the [MeterInstall] Event should be utilised for installing a new Meter, on for example a New Connection MPAN; or an additional meter to an existing set of meters.

6.2 Meter Install JSON example. The example below shows the addition of Meter ID ZZ99Z12345, to MPAN 1315001165123, on 21st March 2022. Ownership of the meter resides with MAP1 from the date of installation. Smart Meter IHD in-home display information is shown here, but population of this data is optional subject to agreement between a Supplier and the Metering Service.

	Meter ID	Status	Install Date	Remove Date	MAP Eff From	MAP ID
0	No Meter History					

```
[
  {
    "payload": {
      "CommonBlock": {
        "S0": {
          "interfaceId": "IF-005",
          "schemaVersion": "1.1.1",
          "eventCode": "[MeterInstall]"
        },
        "S1": {
            S1 Sender Block Content (removed for ease of reading)
        },
        "A0": {
            A0 Routing Block Content (removed for ease of reading)
        },
        "D0": {
            D0 DIP Info Block Content (removed for ease of reading)
        },
        "M0": {
          "MPANCore": "1315001165123",
          "distributorDIPID": "9876054321",
          "GSPGroupID": "_K"
        }
      },
      "CustomBlock": {
        "B906List": [
          {
            "metersection": {
              "meterIDInstalledExisting": "ZZ99Z12345",
              "modifiedMeterID: ""
```

```json
        "meterType": "S2CDE",
        "meterManufacturer": "SIEMENS ZMD120AR44.0200.C4",
        "ESMEGUID": "SC-12-34-56-78-90-12-34",
        "meterLocation": "A",
        "numberOfDigitsCumulativeRegister": 5,
        "meterInstallationDate": "2022-03-21T00:00:00+00:00"
      },
      "MAPHistory": [
        {
          "meterAssetProviderID": "MAP1",
          "meterAssetProviderEffectiveFromDate": "2022-03-21T00:00:00+00:00"
        }
      ]
    }
  ],
  "B030": {
    "IHDInstallStatus": "D",
    "IHDEffectiveFromDate": "2022-03-21T00:00:00+00:00"
  }
        }
      }
    }
  } ]
```

6.3   Outcome following transaction processing:

	Meter ID	Status	Install Date	Remove Date	MAP Eff From	MAP ID
1	ZZ99Z12345	Installed	21/03/2022		21/03/21	MAP1

7.   [MeterRemoval] Usage & Example

7.1   As outlined above, the [MeterRemoval] Event should be utilised for removing a currently active meter.

7.2   For example MPAN 1315001165123 already has two active meters installed:

	Meter ID	Status	Install Date	Remove Date	MAP Eff From	MAP ID
1	ZZ99Z12345	Installed	01/01/2000		01/01/2000	MAP1
2	XX99X12345	Installed	01/02/2002		01/02/2022	MAP1

7.3   JSON example below would affect the removal of meter ZZ99Z12345 on date 1/11/2022

```json
[
  {
    "payload": {
      "CommonBlock": {
        "S0": {
```

```
      "interfaceId": "IF-005",
      "schemaVersion": "1.1.1",
      "eventCode": "[MeterRemoval]"
    },
    "S1": {
        S1 Sender Block Content (removed for ease of reading)
    },
    "A0": {
        A0 Routing Block Content (removed for ease of reading)
    },
    "D0": {
        D0 DIP Info Block Content (removed for ease of reading)
    },
    "M0": {
      "MPANCore": "1315001165123",
      "distributorDIPID": "9876054321",
      "GSPGroupID": "_K"
    }
    },
    "CustomBlock": {
      "B039": {
      "meterIDRemoved": " ZZ99Z12345",
      "meterRemovalDate": "2022-11-01T00:00:00+00:00"
    }
    }
    }
    ] }
```

7.4   Outcome following transaction processing:

	Meter ID	Status	Install Date	Remove Date	MAP Eff From	MAP ID
1	ZZ99Z12345	Removed	01/01/2000	01/11/2022	01/01/2000	MAP1
2	XX99X12345	Installed	01/02/2002		01/02/2022	MAP1

8.   [MeterExchange] Usage & Example

8.1   As outlined above, the [MeterExchange] Event should be utilised for simultaneous removal for an existing meter and installation of a new meter. However, it should be noted that there is nothing in the MHHS Design that would prevent this same outcome being achieved using two separate [MeterRemoval] & [MeterInstall] events.

8.2   For example MPAN 1315001165123 already has meter ZZ00Z12345 installed from date 01/01/2000

	Meter ID	Status	Install Date	Remove Date	MAP Eff From	MAP ID
1	ZZ99Z12345	Installed	01/01/2000		01/01/2000	MAP1

8.3 JSON example below would effect the exchange of meter ZZ99Z12345 for meter XX99X67890 on date 10/11/2022

```
[
 {
   "payload": {
     "CommonBlock": {
       "S0": {
         "interfaceId": "IF-005",
         "schemaVersion": "1.1.1",
         "eventCode": "[MeterExchange]"
       },
       "S1": {
S1 Sender Block Content (removed for ease of reading)
       },
       "A0": {
A0 Routing Block Content (removed for ease of reading)
       },
       "D0": {
D0 DIP Info Block Content (removed for ease of reading)
       },
       "M0": {
         "MPANCore": "1315001165123",
         "distributorDIPID": "9876054321",
         "GSPGroupID": "_K"
       }
     },
     "CustomBlock": {
     "B906List": [
       {
         "metersection": {
           "meterIDInstalledExisting": " XX99X67890",
           "modifiedMeterID: "",
           "meterType": "S2CDE",
           "meterManufacturer": "SIEMENS ZMD120AR44.0200.C4",
           "ESMEGUID": "SC-12-34-56-78-90-12-34",
           "meterLocation": "A",
           "numberOfDigitsCumulativeRegister": 5,
           "meterInstallationDate": "2022-11-10T00:00:00+00:00"
         },
         "MAPHistory": [
           {
             "meterAssetProviderID": "MAP1",
             "meterAssetProviderEffectiveFromDate": "2022-11-10T00:00:00+00:00"
           }
         ]
             }
     "B039": {
         "meterIDRemoved": " ZZ99Z12345",
         "meterRemovalDate": "2022-11-10T00:00:00+00:00"
     }
   }
```

```
      ],
      "B030": {
        "IHDInstallStatus": "D",
        "IHDEffectiveFromDate": "2022-11-10T00:00:00+00:00"
      }
    }
  ] }
```

	Meter ID	Status	Install Date	Remove Date	MAP Eff From	MAP ID
1	ZZ99Z12345	Exchanged	01/01/2000	10/11/2022	01/01/2000	MAP1
2	XX99X67890	Installed	10/11/2022		10/11/2022	MAP1

9.   [MeterUpdate] Event – General Principles

9.1   It is anticipated that these transactions will be used much less commonly, with the [MeterUpdate] event receiving more usage than the [MeterHistoryUpdate]. These transactions are used to update the data associated with an individual currently installed meter [MeterUpdate]; or individual historically removed meters [MeterHistoryUpdate].

9.2   Given these transactions operate on an individual MPAN at a time, it may require several transactions in order to effect the desired change/changes required to the meter history. Albeit that these transactions can be 'clubbed together' and send as a group in single overarching message/API transaction. When multiple transactions are required, transactions should be time-stamped to reflect the correct sequencing order.

9.3   The current validation rules associated with these transactions are described in the MHHS Interface Document, however, the general validation principles applied to these transactions are as follows:

- Can only be submitted by the currently appointed Metering Service (or a previous Metering Service if event type is a [MeterUpdate], and it is still within the 10 day post appointment update window)

- Metering activity, as determined by the Install /Remove Date(s), cannot have taken place in the future

- Metering activity, as determined by the Install Date, must have taken place on or between the MPAN Creation and MPAN Disconnection Dates (validation allows for meter removal at a point following Disconnection if required)

- Meter Serial Number/Meter ID cannot be updated in the same transaction as a change in Install and/or Removal Date

- When amending the Installation and/or Removal date of a Meter, a supporting MAP history commencing in line with the revised Installation Date must also be provided. Any additional MAPs should be provided in chronological order, each with a 'MAP Effective From Date' greater, by at least one day, than the previous.

- When maintaining the MAP History in cases where there is no change in Meter Installation Date then the MAP history provided should commence either with a MAP Effective From Date matching the existing install date of the meter *OR* be greater than the most recent, already existing, MAP Effective From Date. In both cases, any additional MAPs should be provided in chronological order, each with a 'MAP Effective From Date' greater, by at least one day, than the previous.

- Even when amending a meter history, it shall not be possible for two meters with the same 'Meter ID' to be installed, at the same time for the same MPAN.

10. [MeterUpdate] Event Usage

10.1   As outlined above, the [MeterUpdate] Event should be utilised for making changes to a *currently installed* meters only.

10.2   List of possible actions:

- Update Meter Serial Number / Meter ID (n.b. cannot be undertaken in conjunction with a change in Installation Date) ☐ Update Meter Installation Date
- Set Meter Removal Date (to a date prior to the current Metering Service's period of ownership)
- Populate [missing] Meter Technical Details e.g. Location, Manufacturer, Displayed Digits
- Update/Change [existing] Meter Technical Details e.g. Meter Type, GUID, Location, Manufacturer, Displayed Digits
- ~~Replace existing MAP History~~
- Replace/ Extend existing MAP ~~History~~
- Update MPAN IHD Status / Status Date

10.3   Whilst there is a constraint on changing both the Meter ID and Installation Date within the same transaction, other actions can be realised through a single message, in that all data items will be updated to match those provided in the update message (n.b. E2E Architecture convention states that all data items are provided in each message even where these data items are not changing or are null)

10.4   *Caution should be exercised when setting the Meter Removal Date, as this will have the effect of deleting any existing MAP history that extends beyond the requested Removal Date.*

10.5   *Setting the Removal Date to equal the Installation Date will have the effect of 'deleting' the meter, all associated data items and the existing MAP history.*

11. [MeterUpdate] Event Usage – Update Meter ID

11.1   As outlined above, the [MeterUpdate] Event should be utilised for making changes to a *currently installed* meter only.

11.2   For example MPAN 1315001165123 already has meter ZZ99Z12345 installed from date 01/01/2000, but we need correct the MSN to ZZ88Z12345

	Meter ID	Status	Install Date	Remove Date	MAP Eff From	MAP ID
1	ZZ99Z12345	Installed	01/01/2000		01/01/2000	MAP1

11.3   JSON example below would affect the update of Meter ID ZZ99Z12345 to ZZ88Z12345 – the Install Date (protected) would remain the same, but any other data items/MAP history (if provided) would also be amended to match the content of the update message.

```
[
  {
    "payload": {
      "CommonBlock": {
        "S0": {
          "interfaceId": "IF-005",
```

```
            "schemaVersion": "1.1.1",
            "eventCode": "[MeterUpdate]"
          },
          "S1": {
    S1 Sender Block Content (removed for ease of reading)
          },
          "A0": {
    A0 Routing Block Content (removed for ease of reading)
          },
          "D0": {
    D0 DIP Info Block Content (removed for ease of reading)
          },
          "M0": {
           "MPANCore": "1315001165123",
           "distributorDIPID": "9876054321",
           "GSPGroupID": "_K"
          }
        },
        "CustomBlock": {
        "B906List": [
          {
            "metersection": {
              "meterIDInstalledExisting": " ZZ99Z12345",
              "modifiedMeterID: " ZZ88Z12345"
              "meterType": "S2CDE",
              "meterManufacturer": "SIEMENS ZMD120AR44.0200.C4",
              "ESMEGUID": "SC-12-34-56-78-90-12-34",
              "meterLocation": "A",
              "numberOfDigitsCumulativeRegister": 5,
              "meterInstallationDate": "2022-11-10T00:00:00+00:00"
            ]
          }
        ],
        "B030": {
          "IHDInstallStatus": "D",
          "IHDEffectiveFromDate": "2022-11-10T00:00:00+00:00"
        }
      }
    ] }
```

11.4

	Meter ID	Status	Install Date	Remove Date	MAP Eff From	MAP ID
1	ZZ88Z12345	Installed	01/01/2000		01/01/2000	MAP1

12. [MeterUpdate] Event Usage – Update Data Item(s)

12.1   As outlined above, the [MeterUpdate] Event should be utilised for making changes to a *currently installed* meter only.

12.2   JSON example below would affect the update of any/all off the meter characteristics of Meter ID ZZ99Z12345, in that data items/MAP history (if provided) would be amended to match the content of the update message. In the example below the data items in pink would be updated to the values contained in the message.

```
[
 {
   "payload": {
     "CommonBlock": {
       "S0": {
         "interfaceId": "IF-005",
         "schemaVersion": "1.1.1",
         "eventCode": "[MeterUpdate]"
       },
       "S1": {
S1 Sender Block Content (removed for ease of reading)
       },
       "A0": {
A0 Routing Block Content (removed for ease of reading)
       },
       "D0": {
D0 DIP Info Block Content (removed for ease of reading)
       },
       "M0": {
         "MPANCore": "1315001165123",
         "distributorDIPID": "9876054321",
         "GSPGroupID": "_K"
       }
     },
     "CustomBlock": {
     "B906List": [
       {
         "metersection": {
           "meterIDInstalledExisting": " ZZ99Z12345",
           "modifiedMeterID: ""
           "meterType": "S2",
           "meterManufacturer": "L&G E240 Smart v1",
           "ESMEGUID": "MF-12-34-56-78-90-12-34",
           "meterLocation": "B",
           "numberOfDigitsCumulativeRegister": 6,
           "meterInstallationDate": "2022-11-10T00:00:00+00:00"
         ]
       }
     ],
     "B030": {
       "IHDInstallStatus": "A",
       "IHDEffectiveFromDate": "2022-11-10T00:00:00+00:00"
     }
   }
 }
] }
```

13. [MeterUpdate] Event Usage – Replace MAP History

13.1 As outlined above, the [MeterUpdate] Event should be utilised for making changes to a *currently installed* meter only.

13.2 For example MPAN 1315001165123 Meter ZZ88Z12345 currently has the MAP history as shown below:

	Meter ID	Status	Install Date	Remove Date	MAP Eff From	MAP ID
					01/01/2000	MAP1
1	ZZ88Z12345	Installed	01/01/2000		01/06/2021	MAP2
					01/01/2022	MAP3

13.3 JSON example below would affect the updating the MAP history of Meter ZZ88Z12345 so that the first MAP was now 'MAP0', the second 'MAP04', with effective date of 1/8/21 and the third MAP as 'MAP5' from 01/11/22.

```
[
  {
    "payload": {
      "CommonBlock": {
        "S0": {
          "interfaceId": "IF-005",
          "schemaVersion": "1.1.1",
          "eventCode": "[MeterUpdate]"
        },
        "S1": {
          S1 Sender Block Content (removed for ease of reading)
        },
        "A0": {
          A0 Routing Block Content (removed for ease of reading)
        },
        "D0": {
          D0 DIP Info Block Content (removed for ease of reading)
        },
        "M0": {
          "MPANCore": "1315001165123",
          "distributorDIPID": "9876054321",
          "GSPGroupID": "_K"
        }
      },
      "CustomBlock": {
        "B906List": [
          {
            "metersection": {
              "meterIDInstalledExisting": " ZZ88Z12345",
              "modifiedMeterID": "",
              "meterType": "S2",
              "meterManufacturer": "L&G E240 Smart v1",
              "ESMEGUID": "MF-12-34-56-78-90-12-34",
              "meterLocation": "B",
              "numberOfDigitsCumulativeRegister": 6,
```

```
          "meterInstallationDate": "2022-11-10T00:00:00+00:00"
     "MAPHistory": [
          {
          "meterAssetProviderID": "MAP0",
          "meterAssetProviderEffectiveFromDate": "2000-01-01T00:00:00+00:00"
          }
          {
          "meterAssetProviderID": "MAP4",
          "meterAssetProviderEffectiveFromDate": "2021-08-01T00:00:00+00:00"
          }
          {
          "meterAssetProviderID": "MAP5",
          "meterAssetProviderEffectiveFromDate": "2022-11-01T00:00:00+00:00"
          }
     ]
}
```

13.4   OUTCOME

Meter ID		Status	Install Date	Remove Date	MAP Eff From	MAP ID
1	ZZ88Z12345	Installed	01/01/2000		01/01/2000	MAP0
					01/08/2021	MAP4
					01/11/2022	MAP5

NOTE: For the avoidance of doubt, in cases where the MAP history does not simply follow on from the existing history already contained within the registration services (ref next example section 14). ALL existing history held at the registration service will be *replaced* by that provided in the update message (subject to the normal validation rules).

<s>14</s>13. [MeterUpdate] Event Usage - Extend MAP History

1<s>4</s>3.1   As outlined above, the [MeterUpdate] Event should be utilised for making changes to a *currently installed* meter only.

1<s>3</s>4.2   For example MPAN 1315001165123 Meter ZZ88Z12345 currently has the MAP history as shown below:

	Meter ID	Status	Install Date	Remove Date	MAP Eff From	MAP ID
					01/01/2000	MAP0
1	ZZ88Z12345	Installed	01/01/2000		01/08/2021	MAP4
					01/11/2022	MAP5

1<s>3</s>4.3 JSON example below would extend the existing MAP history to include an additional, MAP 'MAP6' effective from 01/12/22

```
[
 {
   "payload": {
    "CommonBlock": {
     "S0": {
       "interfaceId": "IF-005",
       "schemaVersion": "1.1.1",
       "eventCode": "[MeterUpdate]"
     },
     "S1": {
S1 Sender Block Content (removed for ease of reading)
     },
     "A0": {
A0 Routing Block Content (removed for ease of reading)
     },
     "D0": {
D0 DIP Info Block Content (removed for ease of reading)
     },
     "M0": {
       "MPANCore": "1315001165123",
       "distributorDIPID": "9876054321",
       "GSPGroupID": "_K"
     }
    },
    "CustomBlock": {
    "B906List": [
       {
         "metersection": {
           "meterIDInstalledExisting": "ZZ88Z12345",
           "modifiedMeterID": ""
    "meterType": "S2",
           "meterManufacturer": "L&G E240 Smart v1",
           "ESMEGUID": "MF-12-34-56-78-90-12-34",
           "meterLocation": "B",
```

```json
        "numberOfDigitsCumulativeRegister": 6,
        "meterInstallationDate": "2022-11-10T00:00:00+00:00"
"MAPHistory": [
    {
      "meterAssetProviderID": "MAP6",
      "meterAssetProviderEffectiveFromDate": "2022-12-01T00:00:00+00:00"
    }
]
```

13<u>4</u>.4   OUTCOME

	Meter ID	Status	Install Date	Remove Date	MAP Eff From	MAP ID
1	ZZ88Z12345	Installed	01/01/2000		01/01/2000	MAP0
					01/08/2021	MAP4
					01/11/2022	MAP5
					01/12/2022	MAP6

1~~4~~5. [MeterHistoryUpdate] – Amend Meter ID

~~15.2~~

1~~4~~5.1~~3~~

15.4 For example MPAN 1315001165123 has ZZ88Z12345 removed, but we need to correct the MSN to ZZ99Z12345 15.5 Meter ID	Status	Install Date	Remove Date	MAP Eff From	MAP ID
1 ZZ88Z12345	Removed	01/01/2000	01/11/2000	01/08/2000	MAP0
2 XX99Z54321	Installed	01/11/2000		02/11/2000	MAP6

```
[
 {
  "payload": {
   "CommonBlock": {
    "S0": {
     "interfaceId": "IF-005",
     "schemaVersion": "1.1.1",
     "eventCode": "[MeterHistoryUpdate]"
    },
    "S1": {
```
S1 Sender Block Content (removed for ease of reading)
```
    },
    "A0": {
```
A0 Routing Block Content (removed for ease of reading)
```
    },
    "D0": {
```
D0 DIP Info Block Content (removed for ease of reading)
```
    },
    "M0": {
     "MPANCore": "1315001165123",
     "distributorDIPID": "9876054321",
     "GSPGroupID": "_K"
    }
   },
   "CustomBlock": {
   "B906List": [
     {
      "metersection": {
       "meterIDInstalledExisting": " ZZ88Z12345",
       "modifiedMeterID: " ZZ99Z12345"
       "meterType": "S2",
       "meterManufacturer": "L&G E240 Smart v1",
       "ESMEGUID": "MF-12-34-56-78-90-12-34",
```

```
                  "meterLocation": "B",
                  "numberOfDigitsCumulativeRegister": 6,
                  "meterInstallationDate": "2000-01-01T00:00:00+00:00"
          "MAPHistory": [
                  {
                     "meterAssetProviderID": "MAP0",
                     "meterAssetProviderEffectiveFromDate": "2000-01-01T00:00:00+00:00"
                  }
          ]
```

1~~45~~.~~26~~ OUTCOME

	Meter ID	Status	Install Date	Remove Date	MAP Eff From	MAP ID
1	ZZ**99**Z12345	Removed	01/01/2000	01/11/2000	01/08/2000	MAP0
2	XX99Z54321	Installed	01/11/2000		02/11/2000	MAP6

16. [MeterHistoryUpdate] Usage – Meter Deletion

16.1   The action of setting the Removal Date to equal the Installation Date has the effect of deleting the meter instance, including its associated attributes and MAP history.

16.2

	Meter ID	Status	Install Date	Remove Date	MAP Eff From	MAP ID
1	ZZ88Z12344	Removed	01/01/2000	01/08/2000	01/01/2000	MAP0
2	ZZ88Z12345	Removed	01/02/2000	01/08/2000	01/02/2000	MAP0
					01/07/2000	MAP1
3	ZZ88Z12345	Removed	01/08/2000	01/11/2000	01/08/2000	MAP1
4	XX99Z54321	Installed	01/11/2000		02/11/2000	MAP6

```
[
  {
    "payload": {
      "CommonBlock": {
        "S0": {
          "interfaceId": "IF-005",
          "schemaVersion": "1.1.1",
          "eventCode": "[MeterHistoryUpdate]"
        },
        "S1": {
S1 Sender Block Content (removed for ease of reading)
        },
        "A0": {
A0 Routing Block Content (removed for ease of reading)
        },
        "D0": {
```

D0 DIP Info Block Content (removed for ease of reading)
```
    },
    "M0": {
      "MPANCore": "1315001165123",
      "distributorDIPID": "9876054321",
      "GSPGroupID": "_K"
    }
  },
  "CustomBlock": {
  "B906List": [
    {
      "metersection": {
        "meterIDInstalledExisting": " ZZ88Z12344",
        "modifiedMeterID: ""
        "meterType": "S2",
        "meterManufacturer": "L&G E240 Smart v1",
        "ESMEGUID": "MF-12-34-56-78-90-12-34",
        "meterLocation": "B",
        "numberOfDigitsCumulativeRegister": 6,
        "meterInstallationDate": "2000-01-01T00:00:00+00:00"
              }
        "B039": {
            "meterIDRemoved": " ZZ88Z12344",
            "meterRemovalDate": "2000-01-01T00:00:00+00:00"
          }
```

16.3

	Meter ID	Status	Install Date	Remove Date	MAP Eff From	MAP ID
1	ZZ88Z12345X1	Deleted	01/01/2000	01/08/2000	01/01/2000	MAP0
2	ZZ88Z12345	Removed	01/02/2000	01/08/2000	01/02/2000	MAP0
					01/07/2000	MAP1
3	ZZ88Z12345	Removed	01/08/2000	01/11/2000	01/08/2000	MAP1
4	XX99Z54321	Installed	01/11/2000		02/11/2000	MAP6

In the case of Meter and MAP 'removals' – the Registration System will only 'logically' remove the entries – i.e. they will be marked as inactive and not deleted physically from the database.

Change of Segment Overview & Examples

Process Steps Overview
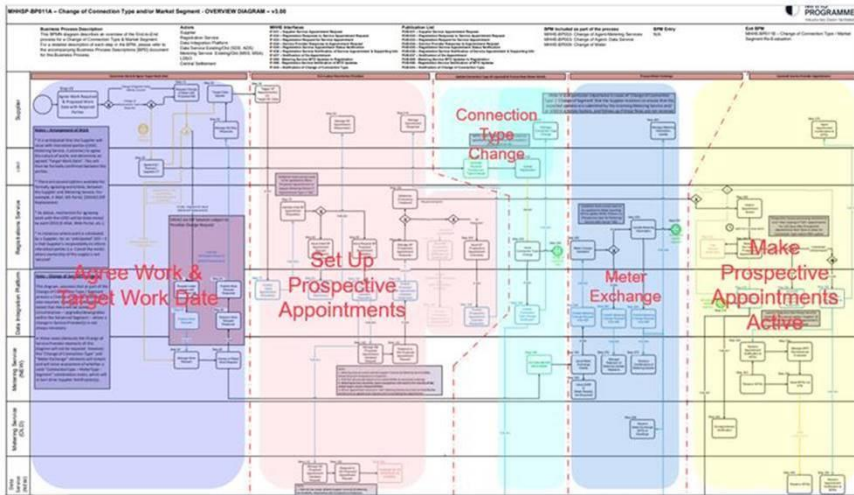
The above gives the breakdown of the Change of Connection Type/ Segment process. The key elements of the process are:

1. The nature of Work and Target Work Date is agreed between the Supplier, LDSO (if a change of Connection is required), and Metering Service
2. The Supplier puts in place the Prospective Service Provider(s) for the new metering where required (The existing Service Provider(s) may be able to provide the Service on a Change of Connection Type only). These are accepted by the Metering Service (and Data Service if required) and queued
3. The Metering Service has the requirement to ensure a prospective appointment has been accepted for the Target Work Date
4. Post work updates
   a. The LDSO (if change of connection) updates Connection Type (DB flow to MPRS) within three~~two~~ working days of work completion
   b. The Metering Service updates Metering Installation (If-005 /PUB-006) within three~~two~~ working days of completion
   c. Combined these updates trigger Registration Service to update Market Segment
5. Registration Service then processes the prospective queued appointments and makes the new Service Provider(s) effective.

Whilst there is a clear requirement on both the LDSO and Metering Service to perform their updates within three~~two~~ working days – it is the Supplier who should take responsibility for ensuring the completion of the overall process.

The Supplier will receive Invalid Market Segment notifications via IF-045, if beyond three~~two~~ working days, only one of the updates has been received and this results in an invalid market segment – at which point the Supplier should investigate and escalate the issue of any missing updates either with the LDSO or their Metering Service.

'SEG' Scenario Appointments are special

It is important that Suppliers use the 'SEG' scenario on their Service Provider appointments when a change of Segment is planned. This is because the 'SEG' scenario is treated differently by the Registration Service, so as to support the Change of Segment process:

- Initial IF-031 validation to check that a Service Provider is valid for the existing MPAN Segment is bypassed
- Normally prospective appointments being processed out of the queue would be evaluated on their Effective From Date and Lapsed if the re-validation failed. Proposed 'SEG' appointments are different in that they remain in the 'appointment queue' and are reprocessed/re-tested for ~~two~~ three working days after the proposed Effective From Date before being lapsed, so as to allow for the processing of the Metering Service metering update and if required the LSDO Connection Type update. Following these updates the proposed Service Providers will be compatible with the new Segment (Connection Type) of the MPAN and the Appointments will pass validation and come into effect (retrospectively from the Effective from Date (ie work date)).
- The existence of the 'SEG' prospective appointment for the Metering Service will also allow that Metering Service to update the Metering details of the MPAN. This would normally be prevented by the Registration Service as that Metering Service wasn't 'currently' appointed – albeit the Meter Install (Exchange date) would still need to be within the period of the proposed appointment (ie. => Effective From date (work date))

Scenario 1 – Change of Segment & Connection Type (Smart (Whole Current) to Advanced (CT))

- The Supplier would need to agree the nature of work required with the LDSO and their preferred Advanced Metering Service
- All parties agree a Planned Work Date
- Supplier will then start the Service Appointment process for Data Service/Metering Service (IF-031)
  - Service Provider's requested should be appropriate for the new/proposed "Advanced Segment"
  - Service Provider Effective Date should match the 'Planned Work Date'
  - Service Provider's should note that the MTD's provided as part of the appointment process (eg. PUB-033) will be those that are currently in place – so may wish to consider validation to ensure normally unsupported Segment /Metering arrangements are accepted when the appointment has the 'SEG' scenario
  - Normally these appointments would be rejected by the Registration Service, for incompatible segment, however the specification of the 'SEG' appointment scenario will bypass these checks at this stage
  - Assume that Service Provider's accept the request for appointment – if not then Supplier should re-submit Service Provider request(s)
- Prospective Service Provider Appointments, for Advanced Metering Service/Data Service, now exist in the appointment queue – waiting for the planned work day to arrive
- Planned Work Day is reached and work is completed
- Following the successful completion of the work two updates are required:
  - LDSO will update the Connection Type using an internal flow into MPRS which will then be issued out on PUB-043
  - Metering Service will issue (IF-005) details of the Metering Change, which will then be issued out on the PUB-006
- Once these two updates have occurred Registration Service will re-evaluate Segment which based on the New Connection Type & metering will move from Smart to Advanced, notified on PUB-044
- At Registration Service Gate Closure Processing (18:00 GMT) the Prospective appointments will be re-evaluated – they will now pass the Service Provider-Segment suitability checks and become active (As of the specified Effective From Date (work date)), which depending on the timing of the LDSO/Metering Service updated maybe up to ~~two~~ three working days retrospectively – PUB-036 will be issued to the incoming (advanced) Service Providers
- De-Appointment messages (PUB-037) will be issued to the outgoing (smart) Service Providers

Scenario 2 – Change of Segment only (Whole Current Advanced to Smart)

- Supplier would need to agree the nature of work required with their preferred Smart Metering Service
- All parties agree a Planned Work Date
- Supplier will then start the Service Appointment process for Data Service/Metering Service (IF-031)
  - Service Provider's requested should be appropriate for the new/proposed "Smart Segment"
  - Service Provider Effective Date should match the 'Planned Work Date'
  - Service Provider's should note that the MTD's provided as part of the appointment process (eg. PUB-033) will be those that are currently in place – so may wish to consider validation to ensure normally

unsupported Segment /Metering arrangements are accepted when the appointment has the SEG scenario
- o Normally these appointments would be rejected by the Registration Service, for incompatible segment, however the specification of the 'SEG' appointment scenario will bypass these checks at this stage
- o Assume that Service Provider's accept the request for appointment – if not then Supplier should re-submit Service Provider request(s)
- Prospective Service Provider Appointments, for Smart Metering Service/Data Service, now exist in the appointment queue – waiting for the planned work day to arrive
- Planned Work Day is reached and work is completed
- Following the successful completion of the work the following update is required:
  - o Metering Service will issue (IF-005) details of the Metering Change, which will then be issued out on the PUB-006
- Once the update has occurred Registration Service will re-evaluate Segment which based on the Connection Type & metering will move from Advanced to Smart, notified on PUB-044
- At Registration Service Gate Closure Processing (18:00 GMT) the Prospective appointments will be re-evaluated – they will now pass the Service Provider-Segment suitability checks and become active (As of the specified Effective From Date (work date)), which depending on the timing of the Metering Service update maybe up to threetwo working days retrospectively – PUB-036 will be issued to the incoming (Smart) Service Providers
- De-Appointment messages (PUB-037) will be issued to the outgoing (Advanced) Service Providers

Scenario 3 – Change of Connection Type Only (No Change of Service Provider) – ADV Whole Current to ADV CT

- Basically the same process as BAU Change of Metering …
- However, the Supplier will need to co-ordinate the arrangement of an 'agreed work date' with the LDSO and Metering Service
- The Supplier will receive Invalid Market Segment notifications via IF-045, if beyond threetwo working days, only one of the updates has been received and this results in an invalid market segment

Scenario 4 Change of Connection Type Only (Change of Service Provider) – ADV Whole Current to ADV CT

- A change in connection type will almost certainly also involve a change of metering, however it is effectively a BAU Change of Metering at the same time as a BAU Change of Service Provider.
- However, the Supplier will need to co-ordinate the arrangement of an 'agreed work date' with the LDSO and Metering Service
- It would involve changing between Advanced and Advanced Service Provider(s) – perhaps as current Metering Service is unable to Support CT Arrangements
- As the Segment is not changing, the Supplier can use the standard 'CSP' (Change of Service Provider) scenario to appoint the new Service Providers.
- The Supplier will receive Invalid Market Segment notifications via IF-045, if beyond threetwo working days, only one of the updates has been received and this results in an invalid market segment

What if Work is rescheduled?

If the work date is rescheduled then the supplier should issue 'new' Data Service/Metering Service proposed appointments, again with the 'SEG' scenario code, for new/ rescheduled planned work date. The proposed Service Provider appointments (for the missed work date) will simply Lapse (PUB-035 issued) - because the work was not done, then there would be no change of connection type/segment updates by the LDSO, so the 'Proposed Appointments' would never 'match' on Segment and would lapse. The original [Segment] Service providers will not be de-appointed and will remain in place.

What if Work did not go ahead?

If the work is cancelled or otherwise did not go ahead, as above, the Proposed Service Provider Appointments (for the new segment), will simply Lapse once the Effective Date of the appointments plus threetwo working days is reached. As above, as the work did not go ahead the LDSO/Metering Service will not have submitted the transactions necessary, therefore the proposed appointments will fail the segment matching checks when processed out of the queue and a PUB-035 will be issued to Supplier and Service Providers. Again the original Service Provider's will remain in place with the appointments unaffected.

What if DNO/Metering Service fail to send flows following successful work?

It is vital that the Metering Service submits its IF-005 (resulting in an issuing of a PUB-006) to notify of the installation of new metering AND if required, that the LDSO updates the Connection Type resulting in the issuing of a (PUB-043) within threetwo working days of the Work Date.

Failure to issue these updates within the threetwo working day window – will result in the lapsing of the Supplier Proposed appointments. Meaning that the Supplier will have to re-issue new Service Provider appointment(s) (again with an Effective Date of the Work Date and reason code 'SEG').

Suppliers will receive Invalid Market Segment notifications via IF-045, if beyond threetwo working days, only one of the updates has been received and this results in an invalid market segment. So as to avoid the Supplier having to undertake rework/re-submission of Service Provider requests it is 'vital' that the LDSO/Metering Service submit their updates within the threetwo working day window.

What if Supplier fails to put Prospective 'SEG' Appointments in place – but work still goes ahead?

Ideally the work should not have proceeded. If the Connection Change is processed Suppliers will receive Invalid Market Segment notifications via IF-045, if beyond threetwo working days, only one of the updates has been received and this results in an invalid market segment. In most circumstances, the existing Service Providers will be Auto De-appointed, by the Registration Service resulting in the Supplier also then receiving "No Service Provider Appointed" reminders. If no prospective MS has been put in place this will prevent the MS submitting the IF-005, until such time as the supplier retrospectively appoints the MS.

Variations in Sending the Meter Exchange flows?

Depending on the parties / agreements between parties involved, it possible that following Change of Segment / Connection Type activity the metering change might be communicated in two different ways:

a. Old Metering Service submits a Remove Only transaction, and New Metering Service submits an Install Only transaction
b. New Metering Service submits an Exchange transaction, removing the old meter and installing the new meter in a single transaction

Both patterns are allowed and provided for in the process design. However, it in the 'install' element that is required in order to allow the Change of Segment/Connection type to proceed.

Note also if pattern (a) is agreed and the old Metering Service fails to remove the old meter – then a "mixed meter" situation will arise and the Registration Service will consider the site to belong to the 'Advanced' segment which may, depending on the circumstances, again result in the auto de-appointment of the existing agents, and block the appointment of 'Smart' Service Provider(s) until the mixed meter situation is resolved i.e. the outstanding meter removal is completed.

Can the Planned Work Date be on a Change of Supplier SSD Date?

Yes, there is nothing in the design to prevent this. However, the incoming supplier should use 'SEG' as the appointment scenario rather than 'COS', even though a COS is occurring. The Supplier will still need to liaise with the LDSO, Proposed Metering Service so as to ensure agreement for work to be undertaken/completed on the SSD.

In the event that the COS event is cancelled or supplier does not acquire ownership of the site as expected – the Supplier should notify the LDSO/Metering Service to cancel and re-schedule the work at the earliest point in time.

Emergency Work

The normal expectation is that Change of Segment / Connection Type work/activity would be arranged and agreed in advance, ideally at least 48hrs.

However, the design does not prevent 'on the day' use of the SEG Scenario. In that in an emergency situation the currently appointed Supplier, with the agreement of the LDSO and Proposed Metering Service undertaking the work, could issue a 'SEG' appointment (effective from date of today), have it approved by the Metering Service, and the work be completed on the same day. The usual threetwo working day window for the LDSO/Metering Service updates would apply.

17. Implementation Notes

17.1 It is assumed that the low level operation of Day-to-Day / BAU event codes is largely self-explanatory, based on the contents of this document.

17.2 The following points provide further guidance, so as to assist the technical implementation of the [MeterUpdate] and [MeterHistoryUpdate] Events.

- Updates made using these transactions should continue to ensure that for any given MPAN no Meter with the *same* Meter ID may exist (in an active status) for the same time period i.e. meter records with the same Meter ID should not have overlapping Install and Remove Dates

- In the first instance, the individual meter record to be updated should be identified using Meter ID and Installation Date only,

  - situations where no meter record can be identified should be rejected;

  - o   situations where multiple existing meters are identified, the selection process

    should be extended to include Meter Removal date (if provided) else;

- If it is not possible to identify a singular meter instance/record even after matching on all three data items, the transaction should be rejected, however this scenario should not be encountered provided the data meets existing Registration Service rules.

- Setting the Removal Date to equal the Installation Date of a meter shall have the effect of deleting it - ref note below

- The Removal, IHD and MAP segments are optional o   The IHD segment, if provided as part of [MeterUpdate], relating to *any currently installed meter* should replace/update the IHD details currently held at the MPAN to which that Meter is associated.

- The IHD segment is not valid for [MeterHistoryUpdate] events – should be prevented by schema constraints, but should be ignored if provided

- A meter can either be created (added with install date prior to current SPs ownership) or 'un-removed' using this method, where the Meter Removal Date is set in the message as <NULL>, using [MeterHistoryUpdate].

- Unless the removal segment is explicitly provided in the message, then only an install/*update* action to a meter entry is possible i.e change of removal date / un-removal is only possible when the Meter Removal segment is actually provided/contained in the message.

- Treatment of the MAP segment:

- Where no MAP update is provided the existing MAP history should align with the provided/revised Meter Install and/or Removal dates, where this is not the case the transaction should be rejected, and the MS should resubmit the requested change supported by a valid MAP history (either from the revised installation data or currently appointed MAP)

- Where a revised MAP history is provided this must cover the entire period of the revised installation period *and* should align either to the revised installation date AND/OR follow-on from the existing (most recent) MAP entry, provided the effective Date of which are prior to the existing/revised Remove Date

Commented [RT(5): DIN17

18. Further Design Considerations

18.1   It is for St Clements and the LDSO's, between them, to specify the detailed design around this area of functionality. However, MHHS Design Team would suggest that the implementation of the wider MHHS changes provides an opportunity for the enhancement to the asset tracking elements of the current application given the registration systems new role in housing and distributing this information to other MHHS Participants.

18.2   Currently it is assumed that amendments to asset history, using IF-005 [MeterUpdate] and [MeterHistoryUpdate] transactions, will result in 'logical' deletion of data, mirroring the existing functionality associated with the use of the D0312.

18.3   However, the recommendation of the MHHS Design Team is that, detailed design of this functionality should *consider* as a minimum some kind of basic audit/control log so that data item values changes and deleted data can be 'written out to' such a log alongside the Supplier ID/DIP Transaction ID which initiated it; or a more sophisticated solution of versioning, using 'asset instance statuses', whereby changes, modifications are managed so as to give complete visibility of the change history.

18.4   MHHS Design Team also recognises that EES may also have a role to play in maintaining and providing visibility of asset and asset change histories, noting that this is also available via the MPAN history report which will be updated with DIP transactional information and could also be used. Any use of EES would be considered to be a 'Consequential Change', for consideration of EES/REC stakeholders, and outside of the direct scope of the MHHS Design.

Change Record

Date	Author	Version	Change Detail
20/02/2023	SI Design	V1.0	Initial Version
11/05/2023	SI Design	V1.1.2	DIN 9, 11, 12, 14, 15, 16, 20 thru 28, 32, 121
21/06/2023	SI Design	V1.2	DIN-370
04/07/2023	SRO Design	V1.3	DIN-017, DIN-383