# MW Dispatch System Set up for Ancillary Service Provider (NGED)

NESO
National Energy System Operator

## DOCUMENT CONTROL

*Change History*

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| 1.0 | 21/09/2023 | Business Logic for MW Dispatch Services for NGED |
| 2.0 | 29/10/2024 | Updated section 3.3 for NGED Unavailability via webservice |
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## CONTENTS

# 1. Introduction

The PAS (Platform Ancillary Services) project has an objective to replace and enhance systems across the Ancillary Service lifecycle. Starting with a flexible dispatch platform, capable of sending and receiving data, such as provider availability submissions and dispatch notifications. This document will focus on the addition of **Non-BM MW Dispatch Services**. For the Service Provider to communicate with NESO they are required to develop the appropriate web services as per the web service specifications.

This document explains the business rules Service Providers need to implement, including the initial set up of the system and the exceptions rules for the web services.

## 1.1. Scope

This document applies to Non-BM providers for MW Dispatch services only and covers the business rules and exceptions which are to be implemented by MW Dispatch Service Providers.

# 2. Initial System Set-up Business Rules

Once a Unit has been successful in pre-qualification/registration, ASDP will receive the Units registration data (including NESO assigned Unit ID) from internal systems. Each of the web service URLs will be tagged against a Unit ID (for the purpose of this document, the Unit ID is the unique ID as per the framework agreement).

The following data items are received from the Contract Files for MW Dispatch Service-

| Data Item | Description |
|---|---|
| Unit ID | Unit ID as per the framework agreement. |
| Contract Start Date | Start date of contract as per framework agreement |
| Contract End Date | End date of contract as per framework agreement |
| Ramp Up Rate | MW / Minute |
| Ramp Down Rate | MW / Minute |
| Allocated MW | Allocated MW per unit |

The Unit ID will be provided as agreed between NESO and Provider. This will act as an identifier for which unit or aggregation of units the messages will pertain to. All prequalified/registered DER units mapped to RDP_NEGATIVE Service Type in the webservices.

# 3. Web Services Business Rules and Exceptions

## 3.1. General business rules and exceptions

This section provides General Business Rules and Exceptions followed for MW Dispatch Service-

- In all the web services and for all the data tags, the data should be trimmed and should be without any **spaces** before or after the data. For example, NESO would expect ‘RDP_NEGATIVE’ instead of ‘RDP_NEGATIVE ’ or ‘ RDP_NEGATIVE’ in the service type.

- The web service will not be accepted if Service Providers send any **blank tags**. This will mean the 'NULL' value will be updated in the PAS system. This is applicable for all the optional fields. If the field is optional, NESO would expect Service Provider to ignore that tag completely from the xml unless mentioned in this document for a particular web service.
- For dispatch / cease instruction web service, NESO will wait for 1 minute to get synchronous response back from Service Providers before the system times out.
- Real Time Availability of a unit should be sent by Service Provider to NESO to intimate the service availability for a unit.
- NESO has made a provision for its systems and Service Providers' systems to be out of sync only by 1 minute. This is reflected in all the DateTimeStamp validations for all web services.
- The TimeStamp specified in request and response for the Services should always be in UTC.

The operational day for MW Dispatch service is defined to be between 05:00am local time if given Calendar Day to 05:00 am local time of the next Calendar Day.

Note: The NESO and DER Service Provider communication for the mentioned services request and response would always be via DNO.

## 3.2. Web Service Versioning

We have introduced web service version to help with traceability for onboarding new Ancillary Services. Current webservice version for MW Dispatch service is Version 3, any changes will be communicated by updating the web specification and business logic document appropriately. Providers will be notified by email of any new documentation.

## 3.3. Unavailability Service

This section provides business logic for the Availability Services to submit unavailability of DER unit. Window unavailability can be submitted only after a unit is successfully registered with NESO.

This web service is used for declaration of unavailable time for DER unit within an operational day. Service Providers are expected to send unavailability request xml for single operational day of a unit (05:00 – 05:00 local time) and should not include the period crossing over operational days.

If DER is unavailable for consecutive two days, Service Providers are expected to send unavailability request split as per operational day start and end date time. The unavailability slot should be rounded off to the nearest 30 mins, i.e. the unavailability period will always be at minimum of 30 mins resolution and should not include seconds in request timestamp.

Unit will be considered as dispatchable or non-dispatchable considering the Real Time Availability flag (PState) received along with RTM and the window unavailability flag. If PState flag is OFF or Unit is in its unavailability period, it will be considered as non-dispatchable.

Unavailability API can be used once a day (Day ahead) to make units unavailable, if units need to be made unavailable outside of this API availability, then providers can send RealTimeAvailability flag (PState) as OFF.

NESO does not expect Service Provider to send overlapping and duplicate unavailable service windows.

The following fields are required to be populated by Service Providers in the request payload during unavailability declaration **– Interface (UNAVAIL-DATA), ServiceType, UnitID, StartDateTime, EndDateTime and DateTimeStamp.**

Service provider can send multiple units unavailability duration within single request payload.

The Unavailability StartDateTime & EndDateTime will need to be specified within the UnAvailabilityWindow Array in the request.

The StartDateTime & EndDateTime should always be within the next Operational Day Timeframe (i.e. between 5:00 am D+1 and 5:00 am D+2) and should always be rounded off to the nearest 30 minute resolution.

No other details should be provided, refer to the sample payloads in the Appendix section_1N from the Web Service Specification v3 document.

**Time specified in unavailability request should always be in UTC.**

**Note**: **Once Service Providers submit the DER unavailability window period, DER unit(s) can't be made available back for specified unavailability time duration.**

## XSD/JSON Rejections from NESO to Service Provider:

The following are different possibilities of XSD/JSON rejections after appropriate XSD/JSON validations:

1. If Interface is missing/blank/other than "UNAVAIL-DATA" or "NAPUnavail3WA" or "NAPUnavailDA"in request payload, NESO rejects the same via XSD/JSON validation and Service Provider should be getting a 400 bad request response back with appropriate message as "Invalid Interface".
2. If ServiceType is missing/blank/other than RDP_NEGATIVE in request payload, NESO rejects the same via XSD/JSON validation and Service Provider should be getting a 400 bad request response back with appropriate message as "Invalid ServiceType".
3. If any UnitID is missing/blank in the request payload, NESO rejects the same via XSD/JSON validation and Service Provider should be getting a 400 bad request response back. The response will also provide the details of the error. – "Invalid UnitID"
4. If StartDateTime is missing/blank in the request payload, NESO rejects the same via XSD/JSON validation and Service Provider should be getting a 400 bad request response back. The response will also provide the details of the error. – "Invalid StartDateTime"
5. If EndDateTime is missing in the request payload, NESO rejects the same via XSD/JSON validation and Service Provider should be getting a 400 bad request response back. The response will also provide the details of the error. – "Invalid EndDateTime"
6. If DateTimeStamp is missing/blank in the request payload, NESO rejects the same via XSD validation and Service Provider should be getting a 400 bad request response back. The response will also provide the details of the error. "Invalid DateTimeStamp".

## NESO Data Validations rules (Will not be communicated to Service Providers via WebService):

In the event when unavailability is failed due to below validation rules by NESO, Service Provider would be communicated via email for the further analysis.

1. If UnitID value differs to what has been set up in PAS application, NESO will reject the unavailability with appropriate message.

2. If the absolute difference between Service Provider DateTimeStamp and NESO's current system time (in UTC) is greater than "five-minutes", NESO will reject the unavailability with FileReason 'AS_Error9'.
3. If UnitID is not mapped to the appropriate ServiceType, NESO will reject the unavailability with FileReason 'AS_Error2'.
4. If StartDateTime or EndDateTime is in the past, NESO will reject the unavailability with Validation as "INVALID" and the WindowReason as 'AS_Error4'.
5. If StartDateTime or EndDateTime is outside of Service term (unit end date), NESO will reject the unavailability with Validation as "INVALID" and the WindowReason as 'AS_Error24'.
6. If there is a repetition / duplicate/overlapping of StartDateTime and EndDateTime across two or more UnAvailabilityWindow arrays in a single file, NESO will reject the affected unavailable windows with Validation as "INVALID" and the WindowReason as 'AS_Error27'.
7. If UnAvailabilityWindow submitted is after gate closure (1hour before operational start date time), NESO will reject unavailability rejection for the affected windows with Validation as "INVALID" and the WindowReason as 'AS_Error34'.
8. If UnAvailability submitted more than once per day for same the DER unit, NESO will reject the unavailability with File Reason 'AS_Error35'.
9. If UnAvailabilityWindow submitted for more than single operational day of a unit or crossing over to next operational day, NESO will reject the unavailability with window Reason 'AS_Error36'.
10. If any UnAvailabilityWindow submitted whose windows Start & End not in format of nearest 30 min rounded off ( XX:00 or XX:30) , NESO will reject the unavailability with window Reason 'AS_Error37'.
11. In the case of any unspecified error, NESO will reject unavailability with Validation as "INVALID" and the WindowReason as 'AS_Error99'.

It should be noted that the multiple error codes have a limit of 200 characters. In the case of error codesexceeding 200 characters, the reasons will be trimmed to 200 characters.

## 3.4. Dispatch/Cease Service

This section provides business logic for the Dispatch / Cease Service. Unit can be dispatched/ceased using the Dispatch/Cease service. VolumeRequested tag is mandatory for dispatch instruction with 0 MW value.

The same DUI is used for both Dispatch and Cease instruction. At any point in time, there will be only one active DUI per Unit ID.

Dispatch instruction will have 'START' and cease instruction will have 'STOP' in the Instruction tag.

A cease instruction will be sent by NESO only after dispatch instruction is accepted. The next dispatch will be sent only after unit is successfully ceased and available back to dispatch.

When dispatch is accepted by Service Provider, the unit should curtail down to 0 MW and Service Provider must send updated RTM meter reading to NESO in next RTM request. This will be used for verification in settlements process.

**Dispatch:**

In case NESO receives REJETCED or ERROR or no confirmation from Service Provider for Dispatch instruction, Service Provider to ensure those units are marked as unavailable for future dispatches via Real time availability flag (PState) sent to NESO. Those units will be tagged as non-dispatchable and will not be available for future dispatches by NESO.
Once the issue is resolved and communication link is re-established, Service Provider to make the units as Available via Real time availability flag (PState) sent to NESO, so the units will be tagged as dispatchable and will be available for Future dispatches.

*Note- if for some reason, Service Provider fails to update the real time availability flag as a part of RTM service, then in that case NESO will consider the latest PState flag received in latest RTM request.*

**Cease:**

In case NESO receives REJETCED or ERROR or no confirmation from Service Provider for Cease instruction, those units will be tagged under Cease failed in NESO. Service Provider to ensure the units which are failed to cease are marked as Unavailable via Real time availability flag (PState) sent to NESO.

Once connection is restored and communication link is established, Service Provider to update Real Time availability flag (PState) as ON, so that the cease failed units will be available back to re-cease at NESO system.

*Note – if Service Provider fails to update RT flag as OFF where Cease has Failed and currently there is loss of communication, NESO will be able to send the Cease instructions as the latest RT flag of that Unit is found as ON and those units are available to retry the cease instruction.*

*if Service Provider fails to update RT flag as ON where Cease has Failed earlier and communication link is restored, NESO will NOT be able to send the Cease instructions as the RT flag of that unit is found as OFF and unit is not available to retry the cease instruction.*

## XSD Rejections from Service Provider:

1. If **ServiceType is invalid or missing value**, NESO expects Service Provider to throw 500 Internal Server Error as XSD validation failure.
2. If **Unit ID is missing**, NESO expects Service Provider to throw 500 Internal Server Error as XSD validation failure.
3. If **DUI is missing**, NESO expects Service Provider to throw 500 Internal Server Error as XSD validation failure.
4. If **Instruction is different to that of XSD or missing**, NESO expects Service Provider to throw 500 Internal Server Error as XSD validation failure.
5. If **DateTimeStamp is missing** in the xml, NESO expects Service Provider to throw 500 Internal Server Error as XSD validation failure.

## Error Code Responses from Service Provider:

1. **Unit ID is not valid**, NESO expects Service Provider to send Dispatch / Cease confirmation response with ERROR in the ResponseCode with the associated Errorcode ‘DCS_Error1’.

2. If **VolumeRequested is different to 0 MW**, NESO expects Service Provide to send Dispatch confirmation response with ERROR in the ResponseCode with the associated Errorcode 'DCS_Error2'.

3. If the **absolute difference** between NESO DateTimeStamp and Service Provider current system time (in UTC) **is greater than 1 min**, NESO expects Service Provider to send Dispatch / Cease confirmation response with ERROR in the ResponseCode with the associated Errorcode 'DCS_Error3'.

4. If **Unit ID is not matching** to that of ServiceType, NESO expects Service Provider to send Dispatch / Cease confirmation rejection with the ErrorCode 'DCS_Error4'.

5. If there is an **unspecified error in the Dispatch or Cease message**, NESO expects DER to send Dispatch / Cease confirmation response with ERROR in the ResponseCode with the associated Errorcode 'DCS_Error99'.

## 3.5. Dispatch / Cease Confirmation Service

This section provides business logic for the Dispatch / Cease Confirmation Service.

Dispatch/Cease instruction confirmation can be sent by Service Provider using Dispatch/Cease Confirmation Service.

**Dispatch**:

If NESO does not receive an Acknowledgement 200 Ok synchronous response past 60 seconds from the dispatch instruction, it will be considered that Service Provider has not acknowledged the instruction.

In the event when NESO does not receive synchronous 200 Ok but asynchronous confirmation back for a dispatch instruction from Service Provider, unit will be considered as ACCEPTED/REJECTED by NESO based on the confirmation response received.

Similarly, if NESO does not receive an asynchronous confirmation after receiving a 200 Ok response to the dispatch instruction that has been sent by NESO past 120 seconds from the dispatch instruction, it will be considered as dispatch IGNORED by NESO.

**Cease**:

If NESO does not receive an acknowledgement 200 Ok synchronous response past 60 seconds from the cease instruction, it will be assumed that Service Provider has not acknowledged the instruction.

In the event when NESO does not receive the synchronous 200 Ok but asynchronous confirmation back for a cease instruction from Service Provider, unit will be considered as ACCEPTED/REJECTED by NESO based on the confirmation response received.

Similarly, if NESO does not receive an asynchronous confirmation after receiving a 200 Ok response to the cease instruction that has been sent by NESO past 120 seconds from the cease instruction, it will be considered as cease IGNORED by NESO.

The same DUI should be sent for both Dispatch and Cease instructions. At any point in time, there will be only one active DUI per Unit ID.

**XSD Rejections from NESO:**

1. If **ServiceType is missing in the xml**, NESO Middleware rejects the same via XSD validation Service Provider should be getting a 500 Internal Server Error response back with appropriate error message.
2. If **Unit ID is missing in the xml**, NESO Middleware rejects the same via XSD validation and Service Provider should be getting a 500 Internal Server Error response back.
3. If **DUI is missing in the xml**, NESO Middleware rejects the same via XSD validation and Service Provider should be getting a 500 Internal Server Error response back.
4. If **Instruction is missing in the xml**, NESO Middleware rejects the same via XSD validation and Service Provider should be getting a 500 Internal Server Error response back.
5. If **ResponseCode is missing** or is not as per the enumeration list as per web service specification, NESO Middleware rejects the same via XSD validation and Service Provider should be getting a 500 Internal Server Error response back.
6. If **DateTimeStamp is missing in the xml**, NESO Middleware rejects the same via XSD validation and Service Provider should be getting a 500 Internal Server Error response back.

**Other Rejections from NESO:**

1. If Unit ID is not matching to the dispatch/cease xml payload NESO has sent, NESO will reject the confirmation with a 400 Bad Request with a message '*Invalid UnitID'* in the response.
2. If Instruction (START or STOP) is not matching to the dispatch/cease xml payload NESO has sent, NESO will reject the confirmation with a 400 Bad Request with a message "*Unexpected 'STOP' instruction type received*" when START is sent in dispatch/cease instruction or "*Unexpected 'START' instruction type received*" message when STOP is sent in dispatch/cease instruction'.
3. If ErrorCode is different to that of the list mentioned in the above section, NESO will reject the confirmation with a 400 Bad Request with a message '*Invalid ErrorCode*' in the response.
4. If the absolute difference between Service Provider DateTimeStamp and NESO's current system time (in UTC) is greater than 1 min, NESO will reject the confirmation with a 400 Bad Request with a message '*Invalid DateTimeStamp'* in the response.
5. If **DUI is not matching** to the dispatch/cease xml payload NESO has sent, NESO will reject the confirmation with a 400 Bad Request with a message '*Invalid DUI*' in the response.
6. If **Dispatch / Cease confirmation is received after 120 seconds**, NESO will reject the confirmation with a 400 Bad Request with a message '*SLA breach*' in the response.

## 3.6. Realtime Metering Service

This section provides business logic for Realtime Metering Service.

NESO expects Service Provider to send updated meter reading to NESO so that the unit can be used for further operational purpose. Meter reads submitted should not be beyond unit's Registered MW (Contracted MW) provided during registration.

The only required fields for all MW Dispatch units are – **ServiceType, UnitID, DateTimeOfMeterReading, MeterReading, PState, DateTimeStamp**, no other fields should be submitted.

NESO expects at least one meter reading in every 15secs from Service Provider along its PState flag. One meter read should be provided per Unit. Service Provider to send the latest MeterReading value (in MW), DateTimeOfMeterReading and PState flag from last 15 secs.

Example: for below meter read data NESO expects Service Provider to send RTM at 10:00:15 with DateTimeOfMeterReading as 10:00:09 and MeterRead value as 1.22.

| DateTimeOfMeterReading | MeterReading |
|---|---|
| 10:00:05 | 1.2 |
| 10:00:06 | 1.29 |
| 10:00:09 | 1.22 |

PState flag decides the unavailability and availability of a unit. If PState flag is received as OFF by NESO from Service Provider, NESO will consider those units as unavailable, and they will not be considered for dispatch. If PState flag is ON, unit would be considered as available to dispatch.

NESO expects the Service Provider to send the PState (RT Flag) as ON/OFF accordingly with every RTM message.

As RTM along with PState is used by NESO to consider the unit to be available to dispatch, until the point NESO receives a valid RTM back and PState as ON, the unit will not be displayed to perform dispatch actions.

1. If NESO does not receive any RTM in the last 2mins, RTM NACK will be sent with an error code 'RTM_Error1'.

The other exceptions are handled as follows.

## XSD Rejections:

1. If **ServiceType is invalid** or missing value, NESO Middleware rejects the same via XSD validation and Service Provider should be getting a 500 Internal Server Error response back.
2. If **UnitID is missing**, NESO Middleware rejects the same via XSD validation and Service Provider should be getting a 500 Internal Server Error response back.
3. If **MeterReading is missing**, NESO Middleware rejects the same via XSD validation and Service Provider should be getting a 500 Internal Server Error response back.
4. If **DateTimeOfMeterReading is missing**, NESO Middleware rejects the same via XSD validation and Service Provider should be getting a 500 Internal Server Error response back.
5. If **DateTimeStamp is missing**, NESO Middleware rejects the same via XSD validation and Service Provider should be getting a 500 Internal Server Error response back.

## Other Rejections:

1. If Unit ID is not mapped to the appropriate ServiceType selected, NESO will reject the RTM with 400 Bad Request with error message '*Unit ID not matching to ServiceType'* in the response.

2. If UnitID value differs to what has been set up in PAS application, NESO will reject the RTM with a 400 bad request including a message '*Invalid UnitID'* in the response.
3. If ServiceType is not valid, NESO will reject the RTM with 400 bad request with message as *"Invalid Service Type*" in the response.
4. If the **absolute time difference** between Service Provider's DateTimeStamp and NESO 's current system time (in UTC) is **greater than 1 min**, NESO will reject the RTM with 400 bad request with a message '*Invalid DateTimeStamp'* in the response.
5. If **DateTimeOfMeterReading** is before or after the Unit activation date, NESO will reject the RTM with a 400 Bad request back including a message '*DateTimeOfMeterReading is not within Unit's activation date*' in the response.
6. If **DateTimeStamp** is not at 00:00:00, 00:00:15, 00:00:30 or 00:00:45 in every minute, NESO will reject the RTM with a 400 Internal Server Error response back including a message '*DateTimeStamp is not in 15 seconds*' in the response.
7. If **PState** is missing or blank, NESO will reject the RTM with 400 bad request back including a message '*Invalid/Blank PState'* in the response.
8. If **DateTimeOfMeterReading** is in future, NESO will reject the RTM with 400 Bad request back including the appropriate message in the response.

## 3.7. Realtime Metering Negative Acknowledgement Service

A Realtime Metering Negative Acknowledgement (NACK) is a message to communicate that we have not received RTM for the last 2 minutes or there is some issue with the Realtime metering that has been sent and until remedied with correct RTM submissions the contract will be unavailable to dispatch.

### XSD Rejections from Service Providers:

1. If ServiceType is not from the list or missing, NESO expects Service Provider to throw 500 Internal Server Error as XSD validation failure.
2. If UnitID is missing, NESO expects Service Provider to throw 500 Internal Server Error as XSD validation failure.
3. If UnitID is not valid, NESO expects Service Provider to send a non 200 http status code back with a message '*Invalid UnitID'.*
4. If StartDateTime or EndDateTime is missing, NESO expects Service Provider to throw 500 Internal Server Error as XSD validation failure.
5. If ErrorCode is not form the list as mentioned in the previous section, NESO expects Service Provider to send a non 200 http status code back with a message '*Invalid ErrorCode'.*
6. If DateTimeStamp is missing, NESO expects Service Provider to throw 500 Internal Server Error as XSD validation failure.
7. If the absolute difference between National ESO DateTimeStamp and Service Provider's current system time (in UTC) is greater than 1 min, NESO expects Service Provider to send a non 200 http status code back with a message '*Invalid DateTimeStamp'.*

## 4. Security rules and exceptions

As per latest Web Service Specifications Version3 NESO is expecting all the webservices to be authenticated with usernames and passwords. Each Service Provider will have one set of username and password pair i.e., if Service Provider has multiple contracts across any ancillary service types, NESO will provide a single pair of username and password across all Unit IDs. If Service Provider sends incorrect username and password or if there is a combination mismatch to the username password to that of Unit ID in the web services, NESO will send the appropriate error (will be only 500 error code when sending backend error exception and for XSD validation failure). It is expected for SPs to send the same to NESO.

Please refer section 4.2 – Security Messages from Web Specification V3 document for more details.

## 5. Appendix

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