



Project Deliverable
**Neutral Market Facilitator
Requirements Specification**

Amendment History

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1 Introduction

1.1 Background

- 1.1.1 The UK electricity industry faces a number of significant challenges as a result of the need to decarbonise electricity supply in order to meet climate change commitments and due to the progressive adoption of new, low carbon technologies into the system.
- a) The need for the economy to move to a low carbon future implies major reductions in generation of power using fossil fuels. There is also an expectation of dramatically rising demand for electricity in the next decade as consumers switch from fossil fuel usage for heating and transportation.
 - b) Power generation is already moving away from fossil fuels with the rise of photo voltaic and wind turbine technologies. Battery technology has also gradually improved to the point where its dual capability of charging and discharging may become significant, particularly in conjunction with electric vehicles.
- 1.1.2 The structure of electricity supply is expected to change substantially. The old model of major power plants pumping electricity into the network in a top down fashion will be supplemented by smaller-scale distribution-connected or demand side generation/demand reduction of electricity, for example from solar panels attach to the roofs of ordinary houses.
- 1.1.3 These challenges have been recognised by the UK government and the Electricity Network Association (ENA). A number of initiatives are underway that seek to address the complex issues that will arise in the next few decades. This document relates to one such initiative, the transition of existing DNOs to DSOs. A part of this transition is the need to create open markets for the buying and selling of electricity supply capacity and demand reduction.
- 1.1.4 The need for one such market, the Neutral Market Facilitator (NMF), that will enable value stacking across the different markets and enable visibility of actions by industry actors is now recognised. There is no existing NMF nor a detailed specification as to how it should operate. This document is a component of the SSEN project to establish the requirements that will support neutral facilitation of the markets, in the first instance as a proof of concept that can be trialled.

1.2 Purpose

- 1.2.1 This document defines the requirements for a trial of a NMF system. It does this by presenting the set of business processes and rules (the To-Be Business Model (TBBM)) that should be supported by the NMF system.
- 1.2.2 The TBBM has been developed in line with the work published under the ENA Open Networks Project and is importantly owner agnostic. This document focuses on the requirements for a NMF system, recognising the number of such systems and the ownership of each element is yet to be defined. A system that is fully compliant with the TBBM will support the business objectives of the NMF in the context of the TRANSITION Project

1.3 Scope

1.3.1 The scope of this requirement specification is a trial NMF system being prepared by SSEN and partners.

1.3.2 Out of Scope

1.3.2.1 The settlement process following a flexible energy dispatch is not in scope. Settlement is expected to be performed by existing financial processes in companies participating in the NMF.

1.3.2.2 Directly issuing a message or signal to any physical energy assets is not in scope for the trials. The NMF system of itself will not start or stop a dispatch of flexible energy. However, the potential for NMF to perform this function will be examined in the trial.

1.4 Derivation

1.4.1 This document addresses the NMF aspects of the TRANSITION Project Request for Proposal Work Package 2 (§1.5a).

1.4.2 Once this document has been formally approved it will be locked. Any evolution of the NMF requirements will be captured in future artefacts, for example the high level design and procurable deliverables for an NMF system.

1.4.3 It has been reviewed alongside the Electricity Flexibility and Forecasting System (EFFS) DSO Requirements document, select Flexibility Exchange requirements and the Flexibility Market Principles work progressing under the ENA Open Networks Project, with generated learning feeding into this revision and or future TRANSITION outputs. Such future outputs will also draw on responses to the Flexibility Market Principles Consultation due to go live in July 2019.

1.5 References

- a) TRANSITION Request for Proposal.
- b) [Open Networks Workstream 3: Product 2 Functional and System Requirements](#).
- c) [ENA Least Regrets Workstream 3 Product 3](#).
- d) Low Carbon London Learnings Report.

1.6 Document Structure

1.6.1 This document contains the following chapters:

- a) **Introduction**, this chapter;
- b) **To-Be Business Model (TBBM)**, outlining the overall context of the NMF system and aspects of the TBBM that are common to all the remaining chapters;
- c) **Business Use Cases (BUCs)**, that define the business processes and business rules for the NMF system;
- d) **Management Reports**, outlines specific reports that should be output by the NMF system, for example statistical reporting for senior management decision making;

- e) **Non-Functional Requirements**, those business requirements which cannot easily be specified as functional requirements (ie in the BUCs) but nonetheless have significance (often global) to the TBBM;
- f) **Appendices**, containing supporting information referenced elsewhere in the TBBM.

1.7 Glossary

1.7.1 See also the Energy Network Association [Glossary](#).

Term	Meaning
BPMN	Business Process Modelling Notation, a diagramming method for drawing business process flows.
BUC	Business Use Case.
Energy Resource	Any physical energy capability that might be offered in the NMF market. Can be supply capacity increase/reduction or demand increase /reduction.
IER	Information Exchange Requirement.
NMF	Neutral Market Facilitator.
NMF Bid	A bid made by an Industry Actor against a standalone NMF Offer.
NMF Energy Resource	An Energy Resource that has been successfully registered for NMF activities by an Industry Actor.
NMF Offer	An offer by an Industry Actor to sell some energy flexibility that is placed in the NMF market.
NMF Bi-lateral Contract	A pre-existing or other non-NMF contract held by an Industry Actor that is recorded in the NMF system. This will facilitate making dispatches of flexible power visible to the DSO concerned and other interested parties.
NMF Proof of Dispatch	A correspondence sent by an Industry Actor on completion of a NMF Dispatch providing proof of the dispatch.
NMF Request	A request by an Industry Actor to buy some energy flexibility that is placed in the NMF market.
Publish	Makes other Industry Actors aware of an NMF Requests/Offer/Bids when first placed in the NMF market.
TBBM	To-Be Business Model
UML	Unified Modelling Language, a standard for producing common information technology diagrams that is widely recognised by the IT industry.
WSC	Whole System Coordinator, a system linked to NMF that will coordinate NMF activities with that of other DSO systems (in particular Forecasting and Power Systems Analysis) and systems that external to a DSO.

2 To-Be Business Model

2.1 Introduction

2.1.1 The TBBM consists of the following chapters of this document:

- a) To-Be Business Model (§1.7);
- b) Business Use Cases (§3);
- c) Management Reports (§4);
- d) Non-Functional Requirements (§5).

2.1.2 This chapter addresses requirements which have relevance across all aspects of the TBBM.

2.1.3 A guide to understanding the content of the TBBM and its diagrams can be found in the TBBM Guide §6.1.

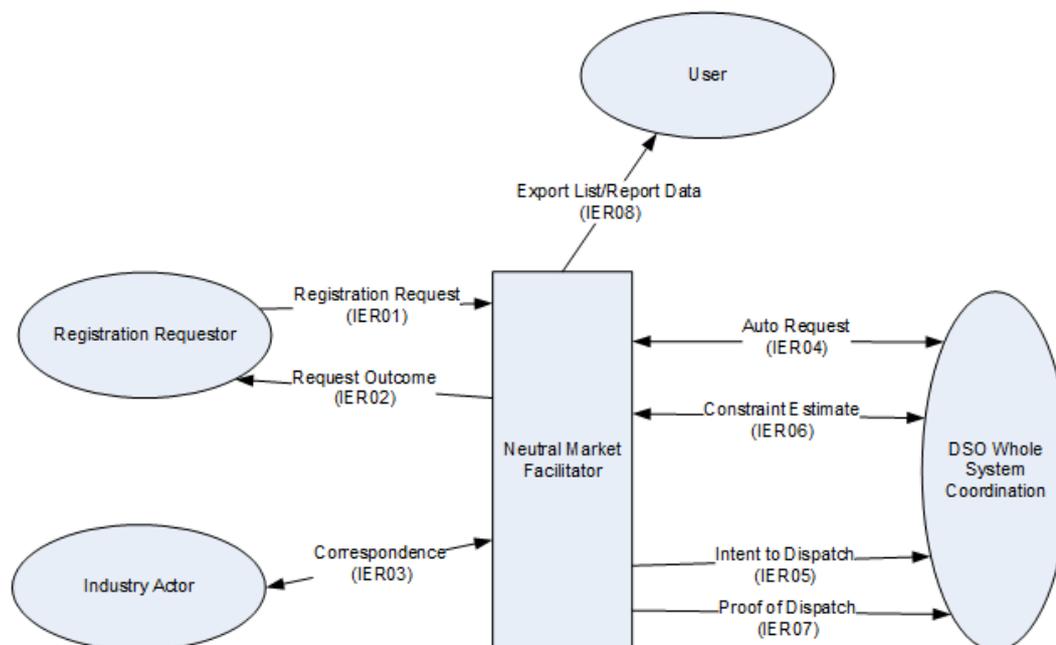
2.2 Stakeholders

2.2.1 The key stakeholders in the NMF system requirements are given below:

Stakeholder	Stake
CGI	Production of this Requirement Specification for the NMF system.
Origami	Company producing use cases and market rules for the flexibility market neutrally facilitated by the NMF.
SSEN	Company leading the TRANSITION project.
OFGEM	Funding for TRANSITION project.
ENWL	Partner in the TRANSITION project.
Open Networks Project / ENA	Overarching programme that includes TRANSITION.

2.3 Context Diagram

2.3.1 The external scope of the NMF is shown in the Context Diagram below. Each external entity (ovals) exchanges data with the NMF as noted by the arrows. The arrows reference the Information Exchange Requirement (IER) which is presented in the Appendices (see §6.2). The IER provides more details (including a reference to the relevant BUC) for each data flow. A more detailed explanation of the Context Diagram and IER can be found in the TBBM Guide §6.1.5.



2.3.2 The following table describes the entities in the Context diagram (anti-clockwise from top left):

Entity	Description
Registration Requestor	A company that makes an application to join the NMF market.
Industry Actor	Companies that have registered to participate in the flexibility market facilitated by the NMF (see 2.3.3).
DSO Whole Systems Coordination System	A new DSO system designed to notify and manage (both proactively and reactively) proposed small scale changes to a DSO electricity network.
User	NMF Users can export tabular lists and reports of data to which they have access rights to either PDF or Excel format files on their workstation.

2.3.3 The following types of companies should be able to be Industry Actors:

- (i) Electricity System Operator (ESO)
- (ii) Distribution System Operator (DSO)
- (iii) Suppliers (electricity retailers)
- (iv) Aggregators (companies that mainly provide demand reduction schemes, but may start to increase demand in response to an excess of generation or low wholesale prices)

- (v) Storage providers (major energy storage providers using technologies such as batteries, hydro and heat pumps)
- (vi) Traders (companies that buy and sell flexibility)
- (vii) Industrial, commercial and small to medium sized enterprise consumers
- (viii) Domestic customers (potentially micro-suppliers having, for example, household solar panels, small wind turbines and/or batteries)
- (ix) Distributed generators (generators, such as solar arrays, embedded within and connected to the DSO's infrastructure).

2.3.4 It should be noted that the NMF system does not issue any direct instructions to the physical assets that produce flexible power. Instead, the NMF system manages the messages to operators of the physical assets (and other parties with a need to know) providing the information needed to enable dispatch of flexible power. Hence the NMF system does not have any data flows to physical assets owned by Industry Actors.

2.4 High Level Business Processes

2.4.1 The following Business Process Modelling Notation (BPMN) diagram illustrates the three main aspects of NMF system functionality following the “happy path”. These processes are addressed in detail in the BUCs.



2.4.2 Process Outlines

2.4.2.1 The following table outlines the business processes in the above diagram.

Process	Description
Offers & Requests	Industry Actors may make NMF Requests and NMF Offers whenever they need to. A given offer/request is made visible to other Industry Actors when published to the NMF market. NMF Requests may also be created through data supplied from an external system.
Bids & Selection	When an NMF Offer or Request has been published, any Industry Actor with a matching need or capability is free to join an auction for the contract flexibility offered or requested. The auction continues for a time period specified in the placing. At the end of the auction the Industry Actor making the NMF Request/Offer selects the NMF Offer(s)/Bid that they favour.
Dispatch	A successful auction may lead to a dispatch of flexible capacity according to the content NMF Offer and instructions from the Industry Actor that has purchased the flexible power. Once the dispatch is complete, the dispatching Industry Actor needs to issue a proof of dispatch to facilitate payment.

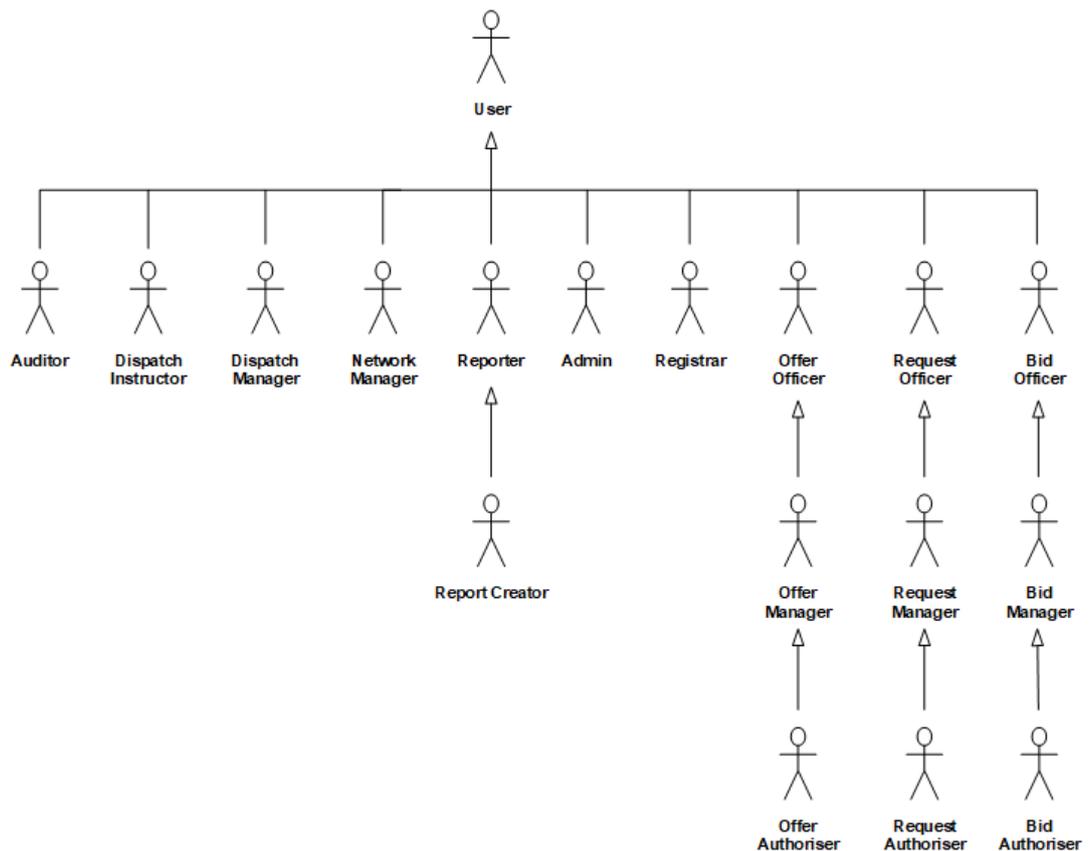
2.5 Roles

2.5.1 The following roles are required by Actors using the NMF system. These roles are specific to the NMF system and are unrelated to any similarly named roles within any other system or company. A detailed explanation about roles can be found in the TBBM Guide §6.1.6.

Role	Description	BUCs
Admin	An NMF system administrator.	
Auditor	An auditor of the NMF system. An auditor needs view only rights to all parts of NMF as well as specific audit functionality.	
Bid Authoriser	A Bid Manager that may authorise bid information for NMF publication.	
Bid Manager	A Bid Officer that may create and amend bid information.	
Bid Officer	A User that may view bid information.	
Dispatch Instructor	A User that has the authority to raise and issue NMF Intent to Dispatch.	
Dispatch Manager	A User that has authority to arrange the fulfilment of a NMF Dispatch and raise a NMF Proof of Dispatch.	30, 31, 34
Network Manager	A User from a DSO or ESO with responsibility to issue fiat instructions to Industry Actors in the event of a risk or issue to their electricity network.	34
Offer Authoriser	A Offer Manager that may authorise offer information for NMF publication.	
Offer Manager	A Offer Officer that may create and amend offer information.	
Offer Officer	A User that may view offer information.	
Registrar	Manages the assessment of companies wishing to become Industry Actors.	
Reporter	A User entitled to produce management reports.	60
Report Creator	A Reporter with additional rights to create and maintain report templates.	61
Request Authoriser	A Request Manager that may authorise request information for NMF publication.	
Request Manager	A Request Officer that may create and amend request information.	
Request Officer	A User that may view request information.	
User	The base role allowing access to the NMF system. Users have view only access to all non-sensitive NMF content relevant to their employing Industry Actor.	

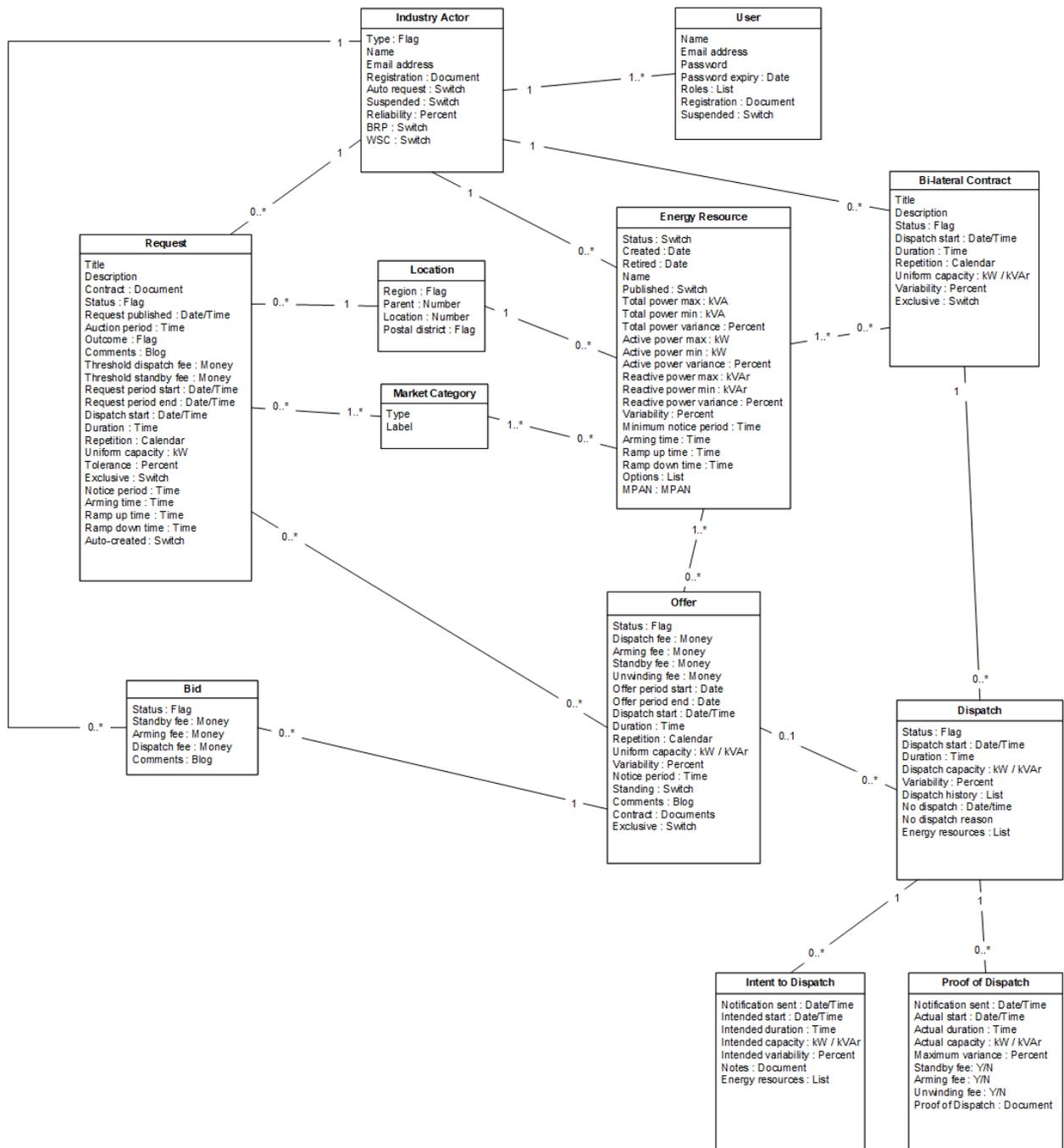
2.5.2 Role Inheritance

2.5.2.1 The following diagram illustrates the NMF system role inheritance model. Inheritance is a means of describing cumulative increases in access rights and authority. In the diagram, the Reporter role inherits the basic User capabilities and has additional rights to run pre-defined management reports (see §4). The Report Creator role inherits the Reporter role’s capabilities and has additional rights to prepare new management report designs. A detailed explanation about role inheritance can be found in the TBBM Guide §6.1.6.



2.6 Domain Model

2.6.1 The following conceptual data model illustrates the data domain for the NMF system. Each rectangle is a data entity which contains a list of data attributes. Attributes can be associated with data types (separated from the attribute by a colon). The data entities have relationships with each other as shown with lines. Multiplicity values are given at each end of a line. Thus an Industry Actor must have one or more (1..*) Users, whereas a given User belongs to exactly one (1) Industry Actor. More details regarding the Domain Model structure can be found in the TBBM Guide §6.1.7.



2.6.2 Entities

2.6.2.1 The following table describes the entities noted in the Domain Model. Details of the data attributes can be found in the Domain Model Data Dictionary §6.3.

Entity	Description
Bid	An NMF Bid. An Industry Actor can make a bid against a published NMF Offer.
Dispatch	Details of the physical dispatch undertaken by a winning NMF Offer or through a NMF Bi-lateral Contract.
Intent to Dispatch	Record of an issued NMF Intent to Dispatch.
Proof of Dispatch	Record of an issued NMF Proof of Dispatch.
Location	The DSO region and the location within that region of an NMF Energy Resource, Request or Offer. A blank location in a region indicates a region wide item.
Market Category	A set of characteristics used to categorise a NMF Energy Resource, Request or Offer. The categories are used for analysis and to inform suitability for submission of Standing Offers. For example, these could include: Voltage Level: 33kV, 11kV, LV... Energy Effect: Supply Generation, Demand Reduction Power Source: Gas, Coal, Nuclear, Hydro, Wind, Solar... Minimum Notice: Short, Medium, Long Standby Request: Y/N Low Carbon: Y/N
Industry Actor	Companies that have registered to participate in the NMF market.
Offer	An NMF Offer made by the Industry Actor to sell flexible energy. It may be the subject of a bid by another Industry Actor to purchase the capacity offered. It may also be presented during an auction for an NMF Request.
Bi-lateral Contract	Information from non-NMF contracts agreed prior to registration or in parallel to the NMF system. See BUC70.
Request	A NMF Request by the Industry Actor to purchase flexible energy.
User	A User of the NMF system. Each User may have one or more roles that determine their level of access to the NMF system (see Roles (§2.5)).

2.7 Locations

2.7.1 NMF BUCs will need to be supported equally for both DSOs and other Industry Actors. The platform on which these services run must be visible and accessible to all potential Industry Actors.

2.7.2 Industry Actors are expected to reside primarily in the UK. However, some Industry Actors may be foreign-owned and need access to NMF from offices outside of the UK, for example to make or review NMF Offers, NMF Requests and NMF Bids.

3 Business Use Cases

3.1 Introduction

3.1.1 The Business Use Cases are high level descriptions of the main business processes that a NMF system should support. This chapter contains most of these BUCs. A small number of BUCs addressing specific functional areas such as Management Reporting are found in their relevant chapters.

3.1.2 The BUCs in this chapter are divided into logical packages. These packages have no special significance and merely provide an aid to understanding related BUCs. The packages are as follows:

- a) **Package A:** System Access
- b) **Package B:** Energy Resources
- c) **Package C:** Requests
- d) **Package D:** Offers
- e) **Package E:** Bids
- f) **Package F:** Dispatch
- g) **Package G:** Bi-lateral Contracts
- h) **Package H:** Miscellaneous

3.1.3 Each package has an associated diagram illustrating the relationship between BUCs in the package and the main actors to which they apply.

3.1.4 A guide to the BUC diagram notation and the BUCs themselves can be found in the TBBM Guide §6.1.8. It is strongly recommended that readers new to BUCs review this Guide before reading the BUCs themselves.

3.1.5 It should be noted that BUC identity numbers are purely to provide a unique reference. They do not follow any particular sequence nor imply an order of processing.

3.1.6 The BUCs are supported by the TBBM Roles (§2.5) and TBBM Domain Model (§2.6).

3.2 General Rules

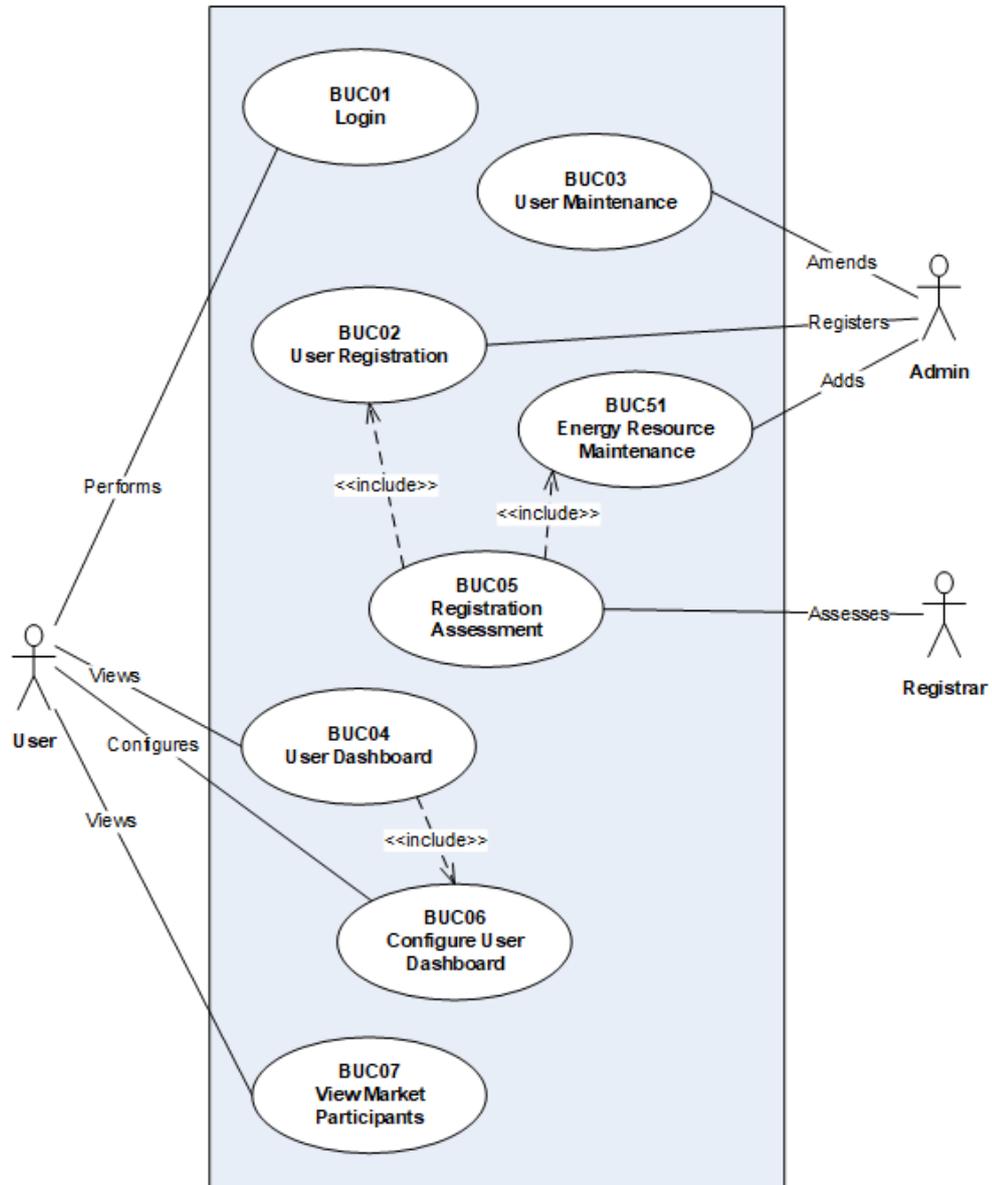
3.2.1 There are a number of business rules and assumptions that are applicable across a range (or all) BUCs. These rules are stated in this section. Except where explicitly identified, BUCs should be read as having these rules applied as well as any specific to a given BUC.

- a) Visibility of NMF Offer, Request and Bid information to Industry Actors is as follows:
 - (i) Offer Officer may view Offers created by their Industry Actor and any related Bids;
 - (ii) Request Officer may view Requests created by their Industry Actor and any related Offers;
 - (iii) Bid Officer may view Offers created by other Industry Actors.

- (iv) Bids are anonymous to all Industry Actors except the Industry Actor that makes the Bid and Industry Actor that made the Offer.
 - (v) Offers related to a Request are anonymous to all Industry Actors except the Industry Actor that makes the Offer and Industry Actor that made the Request.
 - (vi) Following completion of selection of winning Bids, the winning Bids are no longer anonymous to other Industry Actors.
 - (vii) Following completion of selection of winning Offers, the winning Offers are no longer anonymous to other Industry Actors.
 - (viii) Auditors have view-only access to all NMF data.
- b) There should be system wide definition of minimum, maximum and default time periods for completion of NMF market auctions.
- c) All NMF system generated correspondences should be addressed in a consistent manner to help enable automatic queueing by a recipient's system.
- d) Each correspondence produced by the NMF system should be tailored to ensure that the content is limited on a need to know basis.
- e) If the ESO or a DSO does not have a WSC, messages which would be destined for the WSC will instead be sent as correspondences.
- f) Any list presented to a User should:
- (i) Have a sort and filter capability in a similar manner to Microsoft Excel;
 - (ii) Retain the last sort/filter choices for a given list during a login session and reapply them whenever the list is re-presented to the User;
 - (iii) Include a choice to remove any sort/filter criteria from the list and revert to a default list;
 - (iv) Have pagination of long lists with controls for navigation of the list, for example next page, previous page, start and end;
 - (v) Indicate the total number of items present in the overall list;
 - (vi) Have an export capability which includes Adobe PDF and Microsoft Excel format.

3.3 Package A: System Access

3.3.1 The diagram below illustrates the relationships between the set of BUCs relating to NMF system access. A detailed description of BUC diagrams can be found in the TBBM Guide §6.1.8.



3.3.2 BUC01 Login

Users must be able to gain access to the NMF system by a simple but secure mechanism. The precise credentials necessary will be determined in conjunction with SSEN security group.

Extend/Include	None.
Actors	User.
Success Criteria	The User is able perform their work with the NMF.
Preconditions	None.
Trigger	User chooses to access the NMF system through their browser.

Main Path

1. User provides their credentials.

Post Conditions

User can access the NMF system.

Alternative Paths

1a. Already logged in

Post. User continues to access the NMF system without further challenge.

1b. Existing login has expired

1b1. User is asked to provide their credentials again. Resume at step 1.

1c. Forgotten credentials

1c1. User is directed to information allowing them to recover their credential.

Post: User is does not gain access to NMF.

1d. Incorrect credentials

1d1. User is warned that their credentials are not valid. Resume at step 1.

1d1a. Too many login attempts

1d1a1. User account is suspended.

Post: User can no longer access NMF until their account is restored (see BUC03).

1e. First time access

1e1. User is asked to enter a new password and other credentials.

1e1a. Credentials are not valid

1e1a1. User is warned that their credentials are not valid. Resume at step 1e1.

1e1b. Too many attempts

1e1b1. Follow step 1d1a.

1f. Password has expired

1f1. User is asked to provide a new password and/or other credentials. Resume at step 1.

1g. Account is suspended

Post. User is prevented from accessing NMF.

1h. Logout

Post. User does not have access to NMF until they provide their credentials again.

1i. Timed out

Post. User does not have access to NMF until they provide their credentials again.

Business Rules

R1. See Security (§5.3) for details regarding valid User credentials.

3.3.3 BUC02 User Registration

Once a company has successfully applied for access to the NMF (see BUC05), its staff that need access will be assigned their initial access rights through this BUC.

Included in	BUC05 Registration Assessment
Actors	Admin
Success Criteria	A new User can perform tasks according to their role(s) in the NMF system.
Preconditions	Admin has received a valid request to register an individual and, if necessary their company.
Trigger	Admin decides to register the individual.

Main Path

1. Admin navigates to the User Registration functionality.
2. Admin selects the company to which the individual belongs.
3. Admin inputs the individual's registration details.
4. Admin stores request documentation.
5. Admin selects a role(s) for the individual.
6. Admin notifies Industry Actor that the NMF User account has been created.

Post Conditions

The User has an account with the NMF system.

Alternative Paths

2a. New company

- 2a1. Admin inputs the company registration details.
- 2a2. Admin stores the request documentation. Resume at step 3.

2b. Registration already started

- 2b1. Admin selects the company and individual which were previously saved. Resume at step 3.

3a. Registration details saved

- 3a1. Admin saves their work to continue at a later time.
- Post: Admin can return to the individual's registration at a later time.

Business Rules

- R1. User roles are defined in the Roles section (§2.5).
- R2. For a new company, a registration assessment must have been completed successful before the company can become an Industry Actor. See BUC05 Registration Assessment
- R3. A company must always have a User that may be contacted regarding NMF security incidents or other relevant events.
- R4. A company may be marked as entitled to present automated NMF Requests to the NMF system (see BUC16 Automated Request).

3.3.4 BUC03 User Maintenance

Over time, companies and Users may need to have their access rights adjusted or their account suspended.

Extend/Include	None.
Actors	Admin
Success Criteria	Companies and Users have the correct access rights to the NMF system.
Preconditions	The relevant company and user have been registered (see BUC02). Admin has received details of changes to a User or company circumstances.
Trigger	Admin decides updated the User and/or company information.

Main Path

1. Admin navigates to the User Maintenance functionality.
2. Admin selects a company.
3. Admin amends the company details.

Post Conditions

The company and user amends are complete.

Alternative Paths

3a. Suspend company account

3a1. Admin chooses to lock the company account.

Post: All User account belonging to the company are locked.

3b. Restore company account

3b1. Admin chooses to remove the suspension of the company.

Post: All User account belonging to the company have their locks removed.

3c. Amend User account details

3c1. Admin selects a User account.

3c2. Admin amends the User account details.

3c2a. Suspend User account

3c2a1. Admin chooses to lock the User account.

3c2b. Restore User account

3c2b1. Admin chooses to remove the suspension on the User account.

3c2c. Add/remove roles

3c2c1. Admin adds/removes roles for the User account.

3c3. Resume at step 3.

Business Rules

- R1. A suspended User account is left unchanged other than the lock placed on access to NMF.
- R2. A restored User account can gain access to NMF with their previous credentials, or may be required to reset their credentials.

R3. A correspondence will be sent to the Industry Actor noting the actions taken.

3.3.5 BUC04 User Dashboard

This BUC presents the starting point for User activities within the NMR system following login. The intent is that the dashboard content may be configurable through BUC06 Configure User Dashboard.

Includes	BUC06 Configure User Dashboard
Actors	User
Success Criteria	User has summary information pertaining to their work in the flexible energy market and can access all functionality relevant to that work.
Preconditions	None
Trigger	User has navigated to their dashboard.

Main Path

1. User has various containers of information and navigation tools.
2. User chooses an information container or navigation item.

Post Conditions

User is navigated to content related to the selected item.

Alternative Paths

2a. Configure dashboard

- 2a1. User follows BUC06 Configure User Dashboard.
- 2a2. Resume at step 1.

Business Rules

- R1. The content viewed by an ordinary User will be limited to that related to their company. Users with additional privileges as defined for their role(s) may see additional information.
- R2. Examples of content that might be presented in the User dashboard include:
 - List of recently accessed NMF Offers or NMF Requests or NMF Bids.
 - List of NMF Offers or NMF Requests nearing their threshold date/time.
 - Standby bids that have won an auction but with no specific instruction to dispatch as yet.
 - Standing Bids with no commitments to dispatch (ie potentially under-utilised).
 - Outstanding items needing authorisation.

3.3.6 BUC05 Registration Assessment

Access to NMF information should be limited to companies with a legitimate need to view the flexible energy market. This BUC outlines an assessment process to ensure that only approved companies can access the NMF system.

Include	BUC02 User Registration BUC51 Energy Resource Maintenance
Actors	Registrar, Admin
Success Criteria	More flexibility is added to the NMF.
Preconditions	Registrar has received a request from a company wishing to become an Industry Actor.
Trigger	Registrar decides to begin a registration assessment.

Main Path

1. Registrar finds the registration request documentation to be valid and complete.
2. Registrar issues documentation for assessment.
3. Registrar arranges for a registration assessment to begin.
4. Registrar receives and reviews the outcomes of the registration assessment.
5. Registrar notifies company that the request has been accepted.
6. Registrar notifies Admin of successful request.
7. Follow BUC02 User Registration
8. Follow BUC51 Energy Resource Maintenance

Post Conditions

Requesting company is registered as an Industry Actor.

Alternative Paths

- 1a. Invalid or inappropriate request
 - 1a1. Registrar notifies requestor of rejection.
 - Post: Requestor does not become an Industry Actor.
- 5a. Registration request rejected
 - 5a1. Registrar notifies requestor of rejection.
 - Post: Requestor does not become an Industry Actor.

Business Rules

- R1. A registration rejection notification should include the reasons for rejection.

Observation

This BUC intentionally skirts around the issue of assessment. This seems likely to be a matter for the local DSO's approach and market rules.

For a trial system with a few known participants, this BUC might not be considered a priority and could be done manually.

3.3.7 BUC06 Configure User Dashboard

A means to provide configuration tools to those accessing the NMF through the User Dashboard may be desirable.

Included in	BUC04 User Dashboard
Actors	User
Success Criteria	User has the optimum set of items on their dashboard to efficiently perform their tasks in the NMF system.
Preconditions	None.
Trigger	User has chosen to configure their dashboard.

Main Path

1. User has a list of all available dashboard items for the role(s).
2. User chooses the dashboard items that they want to appear in their personal dashboard.

Post Conditions

Resume in parent BUC.

Alternative Paths

None.

Business Rules

None.

Observation

For a trial system this BUC might be considered a nice-to-have rather than a priority feature.

3.3.8 BUC07 View Industry Actors

An Industry Actor can find, list and view details that have been published by other Industry Actors.

Extend/Include	None
Actors	User
Success Criteria	Each Industry Actor has ready access to basic and published information regarding all the other Industry Actors.
Preconditions	None.
Trigger	User decides to view Industry Actor information.

Main Path

1. User navigates to the view Industry Actor functionality.
2. User has a list of Industry Actors.
3. User selects an Industry Actor.
4. User views details of the Industry Actor.

Post Conditions

User has been able to view basic and published information of an Industry Actor.

Alternative Paths4a. Send Correspondence

- 4a1. User chooses to prepare and send a correspondence to be sent to the Industry Actor.

4b. View Energy Resource

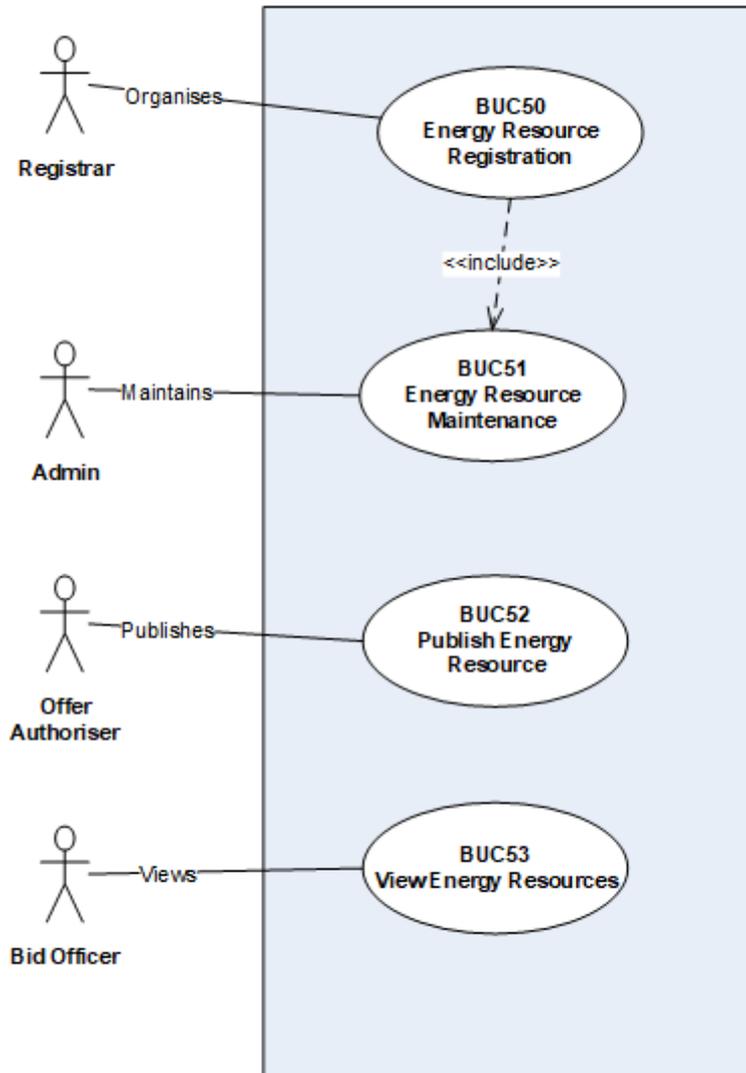
- 4b1. User selects a published NMF Energy Resource controlled by the Industry Actor being viewed.
- 4b2. User view details of the NMF Energy Resource.

Business Rules

- R1. The correspondence sent by the User should automatically include information regarding the User and the Industry Actor to which they are employed.

3.4 Package B: Energy Resources

3.4.1 The diagram below illustrates the relationships between the set of BUCs relating to the registration and management of Energy Resources. A detailed description of BUC diagrams can be found in the TBBM Guide §6.1.8



3.4.2 BUC50 Energy Resource Assessment

The process by which an Industry Actor requests additions and changes to their NMF Energy Resource holding. These need to be validated using DSO criteria.

Includes	BUC51 Energy Resource Maintenance
Actors	Registrar
Success Criteria	The Industry Actor can easily change their NMF assets to match changes on the ground.
Preconditions	Industry Actor wishes add or change their NMF Energy Resource holding.
Trigger	Registrar has received a correspondence from the Industry Actor containing the request for changes.

Main Path

1. Registrar reviews the request content and finds it satisfactory.
2. Registrar arranges for an Energy Resource assessment to begin.
3. Registrar receives and reviews the outcomes of the Energy Resource assessment.
4. Registrar notifies Industry Actor that the request has been accepted.
5. Registrar notifies Admin of successful request.
6. Follow [BUC51 Energy Resource Maintenance](#)

Post Conditions

The changes to the Energy Resources requested have been made.

Alternative Paths

- 1a. Request content incomplete or invalid
 - 1a1. Registrar notifies Industry Actor of the issues blocking the request.
Post: No changes are implemented.
- 4a. Assessment fails
 - 1a1. Registrar notifies Industry Actor of the issues blocking the request.
Post: No changes are implemented.

Business Rules

None.

Observation

This BUC intentionally skirts around the issue of assessment. This seems likely to be a matter for the local DSO's approach and market rules.

3.4.3 BUC51 Energy Resource Maintenance

The Energy Resource holding of an Industry Actor will vary over time.

Included in	BUC05 Registration Assessment
Actors	Admin
Success Criteria	The Industry Actor has accurately present their flexible energy capability to the NMF market.
Preconditions	Admin has received a notification requesting amendment(s) to an Industry Actor's holding of NMF Energy Resources.
Trigger	Admin decides to alter the NMF Energy Resources controlled by an Industry Actor.

Main Path

1. Admin navigates to the Industry Actor details.
2. Admin selects an Energy Resources from the Industry Actor's holding.
3. Admin amends the details of the Energy Resource. Resume at step 2

Post Conditions

The Industry Actor's holding of NMF Energy Resources has been updated successfully.

Alternative Paths

1a. Invalid or incomplete request

- 1a1. Admin raises a correspondence highlighting the issues and sends the correspondence to the Industry Actor.

Post: No changes are made to the Energy Resource holding.

2a. Notification of changes

- 2a1. Admin chooses to send a correspondence to the Industry Actor stating changes as requested to their Energy Resource holding have been made. Resume at Post Conditions.

2b. Add Energy Resource

- 2b1. Admin chooses to add a new Energy Resource to the Industry Actor.
- 2b2. Admin has an empty Energy Resource to populate.

3a. Retire Energy Resource

- 3a1. Admin chooses to retire the Energy Resource from the Industry Actor's holding.
- 3a2. Admin provides the date at which the Energy Resource has been/will be retired. Resume at step 2.

3b. Duplicate Energy Resource

- 3b1. Admin chooses to create a duplicate of the Energy Resource.
- 3b2. Admin amends the duplicated copy of the Energy Resource. Resume at step 2.

Business Rules

- R1. The notification from the Industry Actor to make changes must be from either a Registrar (for new Industry Actors) or an Offer Authoriser for the Industry Actor.

- R2. Amending a NMF Energy Resource invalidates any outstanding NMF Bid for which it is a component.
- R3. A NMF Energy Resource cannot be amended if it has been a component of a successful NMF Offer.
- R4. A retirement date may not precede any commitment as a result of a successful NMF Offer.
- R5. The notice period for the NMF Energy Resource must be greater than the sum of the arming time and the ramp up time.

3.4.4 BUC52 Publish Energy Resource

Industry Actor makes an Energy Resource visible to other Industry Actors.

Extend/Include	None.
Actors	Offer Authoriser
Success Criteria	NMF Energy Resources visible to other Industry Actors is up to date.
Preconditions	The Industry Actor has an NMF Energy Resource.
Trigger	Offer Authoriser decides to publish or retract an Energy Resource from the NMF market.

Main Path

1. Offer Authoriser navigates to the Industry Actor details.
2. Offer Authoriser selects the NMF Energy Resource to be published.
3. Offer Authoriser chooses to publish the Energy Resource.

Post Conditions

The NMF Energy Resource is made visible to other Industry Actors.

Alternative Paths2a. Retract publication

2a1. Offer Authoriser selects the NMF Energy Resource to be retracted.

2a2. Offer Authoriser chooses to retract the Energy Resource.

Post: The NMF Energy Resource is no longer visible to other Industry Actors.

Business Rules

- R1. An unpublished NMF Energy Resource may be a component of a NMF Offer.
- R2. A successful NMF Offer will cause any unpublished component NMF Energy Resource of the offer to become published. It may then not be retracted but may be retired (see BUC51).

3.4.5 BUC53 View Energy Resources

An Industry Actor can find, list and view NMF Energy Resources that have been published by other Industry Actors.

Extend/Include	None.
Actors	Bid Officer
Success Criteria	Industry Actors can view published energy resources of other Industry Actors in support of possible commercial arrangements.
Preconditions	None.
Trigger	Bid Officer decides to view Energy Resources.

Main Path

1. Bid Officer navigates to the view NMF Energy Resource functionality.
2. Bid Officer has a list of NMF Energy Resources.
3. Bid Officer selects an Energy Resource.
4. Bid Officer views details of the Energy Resource.

Post Conditions

Bid Officer has been able to view any published Energy Resource.

Alternative Paths

4a. Send Correspondence

- 4a1. Bid Officer chooses to prepare a correspondence regarding the Energy Resource.
- 4a2. Bid Officer sends the correspondence. Resume at step 2.

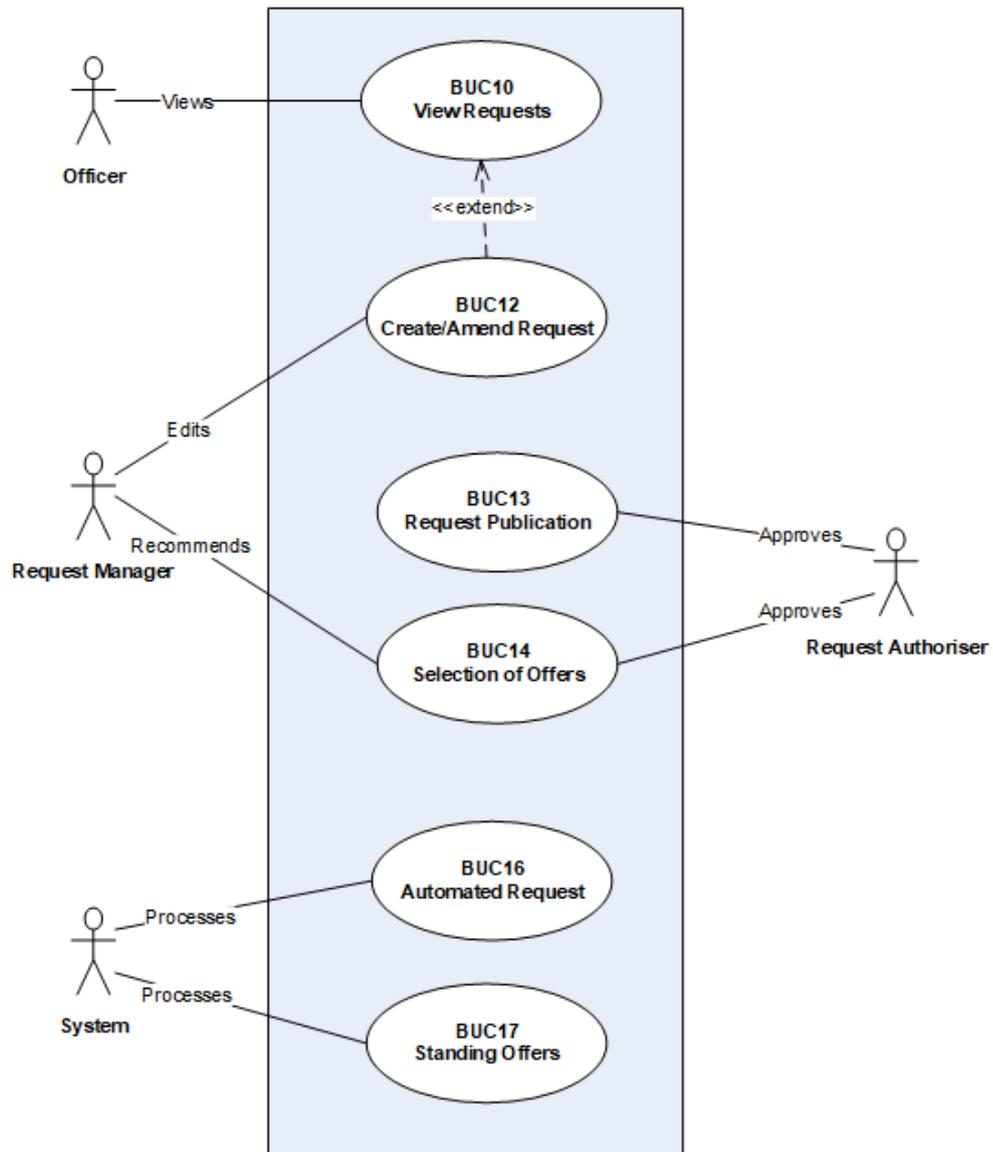
Business Rules

- R1. The correspondence sent by the Bid Officer should automatically include the details of the Energy Resource.

3.5 Package C: Requests

3.5.1 Industry Actors may make NMF Requests (a request for energy flexibility against which other Industry Actors can offer their available flexibility) whenever they need to. A given NMF Request is made visible to other Industry Actors when published to the market.

3.5.2 The diagram below illustrates the relationships between the set of BUCs relating to NMF Requests. A detailed description of BUC diagrams can be found in the TBBM Guide §6.1.8



3.5.3 BUC10 View Requests

This BUC provides the starting point to find an NMF Request. By default, the list provided is limited by the Industry Actor and role of the User. It can be further filtered and sorted to refine the list to the satisfaction of the Actor. Also if a specific Request identifier is known then this can be provided by the Actor to the NMF system to retrieve the Request.

This BUC might also be followed for a specific NMF Request when found in, for example, a User's dashboard or a link in a correspondence.

Extended by	BUC12 Create/Amend Request
Actors	Request Officer, Offer Officer (Officer), Request Manager, Offer Manager
Success Criteria	Industry Actor has knowledge of the available requests in the NMF market.
Preconditions	Officer decides to view the NMF Requests.
Trigger	Officer navigates to the NMF Request functionality.

Main Path

1. Officer has a list of NMF Request.
2. Officer selects a NMF Request from the list.
3. Officer views details of the selected NMF Request.

Post Conditions

Officer has been able to review all aspects of the NMF Request.

Alternative Paths

- 1a. Request already chosen
 - 1a1. Resume at step 2a2.
- 2a. Find by identifier
 - 2a1. Officer provides the unique identifier of a NMF Request.
 - 2a2. Officer views details of the NMF Request.
 - 2a2a. Invalid identifier
 - 2b2a1. Officer is warned that the identifier is not valid. Resume at step 1.
 - 2a2b. Insufficient permissions
 - 2a2b1. Officer is warned that their role(s) do not allow them to view the NMF Request. Resume at step 1.
- 3a. Amend Request
 - 3a1. Request Manager follows BUC12 Create/Amend NMF Request
 - 3a2. Resume at step 1.
- 3b. Make an Offer
 - 3b1. Offer Manager follows BUC57 Make an Offer for a Request
 - Post. Offer Manager begins making a NMF Offer for the NMF Request.

Business Rules

None.

3.5.4 BUC12 Create/Amend Request

The basic administration functionality for NMF Request details.

Extends	BUC10 View Requests
Actors	Request Manager
Success Criteria	Creates the opportunity for the Industry Actor to buy flexible energy from the NMF market.
Preconditions	The Industry Actor has insufficient supply or demand capacity.
Trigger	Request Manager has navigated to this BUC.

Main Path

1. Request Manager updates details of their NMF Request.

Post Conditions

A draft NMF Request has been updated.

Alternative Paths

1a. Create new NMF Request

- 1a1. Request Manager has an empty NMF Request. Resume at step 1.

1b. Save for later

- 1b1. Request Manager saves their work to continue at a later time. Return to calling BUC.

1c. View offer

- 1c1. Request Manager selects related NMF Offer to view.
- 1c2. Request Manager views details of the NMF Offer.
- 1c3. Resume at step 1.

1d. Request Categorisation

- 1d1. Request Manager selects one or more categorisation items to append to the NMF Request.
 - 1d1a. Remove categories
 - 1d1a1. Request Manager removes one or more categorisation items from the NMF Request.
- 1d2. Resume at step 1.

1e. Supporting documents

- 1e1. Request Manager adds supporting documents to the NMF Request.
 - 1e1a. Remove documents
 - 1e1a1. Request Manager removes a document from the NMF Request.
- 1e2. Resume at step 1.

1f. Mark NMF Request for Publishing

- 1f1. Request Manager marks the NMF Request as ready for publishing.

1f1a. NMF Request is incomplete or inconsistent

1f1a1. Request Manager is warned of the issue. Resume at step 1.

Post: Resume in parent BUC.

1g. Mark NMF Request for withdrawal

1g1. Request Manager marks the NMF Request for withdrawal.

Post: Resume in parent BUC.

1h. Mark NMF Request as dropped

1h1. Request Manager selects an outcome.

Post: Resume in parent BUC.

1i. Commentary

1i1. Request Manager adds a comment to the NMF Request blog.

1i2. Resume at step 1.

Business Rules

- R1. When an NMF Request is marked ready for publishing, a correspondence should be sent to the Request Authoriser asking for approval.
- R2. When an NMF Request is marked for withdrawal, a correspondence should be sent to the Request Authoriser asking for approval.
- R3. Once published, the content of a NMF Request may not be changed in any way except for making comments and invoking a withdrawal.
- R4. Events occurring during the life cycle of the NMF Request will be recorded in the blog for the offer indicating the timestamp, User that triggered the event and a description or comment.
- R5. The NMF Request blog will only be visible to Users of the Industry Actor making the offer and NMF Auditors.

3.5.5 BUC13 Request Publication

A draft NMF Request needs to be approved before it becomes visible to other Industry Actors. This begins an auction in which Industry Actors can present offers to fulfil the request. This BUC also provides for the withdrawal of a published request.

Extend/Include	None
Actors	Request Authoriser
Success Criteria	The Industry Actor can make a request for energy flexibility, or withdraw a request that no longer meets business needs.
Preconditions	Request Authoriser has received a request to publish (or withdraw) an NMF Request.
Trigger	Request Authoriser decides to review and approve the request.

Main Path

1. Request Authoriser navigates to the NMF Request functionality.
2. Request Authoriser has a list of their Industry Actor's NMF Requests.
3. Request Authoriser selects to the relevant NMF Request.
4. Request Authoriser approves the publication of the NMF Request.

Post Conditions

The NMF Request is visible to other Industry Actors. This should be followed by BUC17 Standing Offers.

Alternative Paths

- 1a. Request has been previously selected
 - 1a1. Resume at step 4.
- 4a. Withdraw Request

Request Authoriser approves the withdrawal of the NMF Request.

Post: The NMF Request is no longer visible to other Industry Actors.
- 4b. Not approved
 - 4c1. Request Authoriser makes review comments.

Post: The NMF Bid status is unchanged.

Business Rules

- R1. When approved, all Industry Actors should be informed by correspondence of the NMF Request.
- R2. When withdrawn, all Industry Actors that have begun drafting or have published a NMF Offer relating to the NMF Request must be informed by correspondence of the withdrawal.
- R3. A withdrawal will cancel an auction for the NMF Request and any NMF Offers already made.
- R4. Once published, the content of a NMF Request may not be changed in any way except for making comments and invoking a withdrawal.

3.5.6 BUC14 Selection of Offers

The choice of a winning offer(s) is entirely a matter for the Industry Actor publishing the NMF Request. There is no requirement that the award is based purely on price, as might be the case for a conventional auction. This is because the selection criteria may be more complex than a simple price orientated auction. For example, selectors might be willing to accept a higher price of an offer that better supports their environmental objectives.

Extend/Include	None
Actors	Request Manager, Request Authoriser
Success Criteria	A risk to the electricity network and supply has been partially mitigated.
Preconditions	The auction deadline for a NMF Request has passed.
Trigger	Request Manager decides to select a winning NMF Offer(s).

Main Path

1. Request Manager selects the NMF Request needing a winning offer selection.
2. Request Manager is able to view each NMF Offer.
3. Request Manager marks each NMF Offer that is proposed as a winner.
4. Request Manager requests approval for the winning NMF Offer(s).
5. Request Authoriser approves the winning NMF Offer(s).

Post Conditions

The winning NMF Offers have a contract to supply their Energy Resource.

Alternative Paths

1a. Pre-selected NMF Request

- 1a1. Request Manager has already selected the NMF Request. Resume at step 2.

3a. No successful offers

- 3a1. Request Manager makes a comment regarding the reason no NMF Offer has been successful.
- 3a2. Request Manager request approval for the no-win outcome.
- 3a3. Request Authoriser approves the no-win outcome.

3a3a. Approval withheld

- 3a3a1. Request Authoriser makes a comment regarding the rejection reason.
Resume at step 2.

Post: No winners are announced.

5a. Approval withheld

- 5a1. Request Authoriser makes a comment regarding the rejection reason. Resume at step 2.

Business Rules

- R1. Request Manager's request for approval is made via a correspondence.
- R2. Request Authoriser's decision is made via a correspondence.

- R3. When selecting the winning NMF Offers, the Request Manager will be made aware of any existing commitment made on an NMF Energy Resource during the period from start of the notification period to the end of the dispatch period. These commitments should include:
- Exclusive offers
 - NMF Intent to Dispatch issued
 - Standby arrangements
- R4. The following Industry Actors will be sent a single correspondence following authorisation of the winning bids:
- Each Industry Actor that made a winning NMF Offer;
 - Each Industry Actor that has made an unsuccessful NMF Offer;
 - Each DSO that has a NMF Energy Resource located in their region in the winning NMF Offers. For the DSO, the correspondence should be a WSC message;
 - Each BRP which has not otherwise been notified above and has an NMF Energy Resource included in the winning NMF Offers.

3.5.7 BUC16 Automated Requests

Given the short time scales at which the NMF is expected to operate and the possible levels of volatility which could occur with micro-generation and storage, it is thought that the ability to place short term requests will be important, particularly to DSOs. The intent is that external DSO systems will be able to generate these requests by automated analysis of the electricity network.

Extend/Include	None.
Actors	System
Success Criteria	An Industry Actor can efficiently mitigate against volatility in the supply and demand for energy over small time scales and specific locations.
Preconditions	None.
Trigger	A message from an Industry Actor requiring that an NMF Request be raised in the NMF market.

Main Path

1. System accepts the message.
2. System creates and publishes an NMF Request.
3. System sends a message to the Industry Actor that the NMF Request has been published.
4. System notifies Industry Actors of the NMF Request.

Post Conditions

The NMF market has an NMF Request available to accept offers.

Alternative Paths

- 1a. Invalid message
 - 1a1. System replies to the message stating the errors.

Post: No NMF Request is created.

Business Rules

- R1. The Industry Actor must have been approved for sending automated NMF Request to the NMF market during the Registration process.

3.5.8 BUC17 Standing Offers

An Industry Actor may make a standing NMF Offer for any compatible NMF Request. Whenever a suitable NMF Request is published, the NMF Offer will be automatically placed in the auction without further User instruction. This mechanism is most likely to be useful where a DSO requests standby capacity.

Extend/Include	None
Actors	System
Success Criteria	Industry Actor maximises the usage of its Energy Resource.
Preconditions	A NMF Offer has been set for automatic auction placement.
Trigger	A NMF Request has been published.

Main Path

1. System determines that the NMF Request is consistent with the standing NMF Offer.
2. System generates an NMF Offer based on the standing NMF Offer and publishes it to the auction.
3. System notifies the Industry Actor of their NMF Offer that has been made.
4. System notifies the Industry Actor responsible for the NMF Request of the NMF Offer.

Post Conditions

A NMF Offer has been successfully placed against the NMF Request.

Alternative Paths

1a. Inconsistent with NMF Request

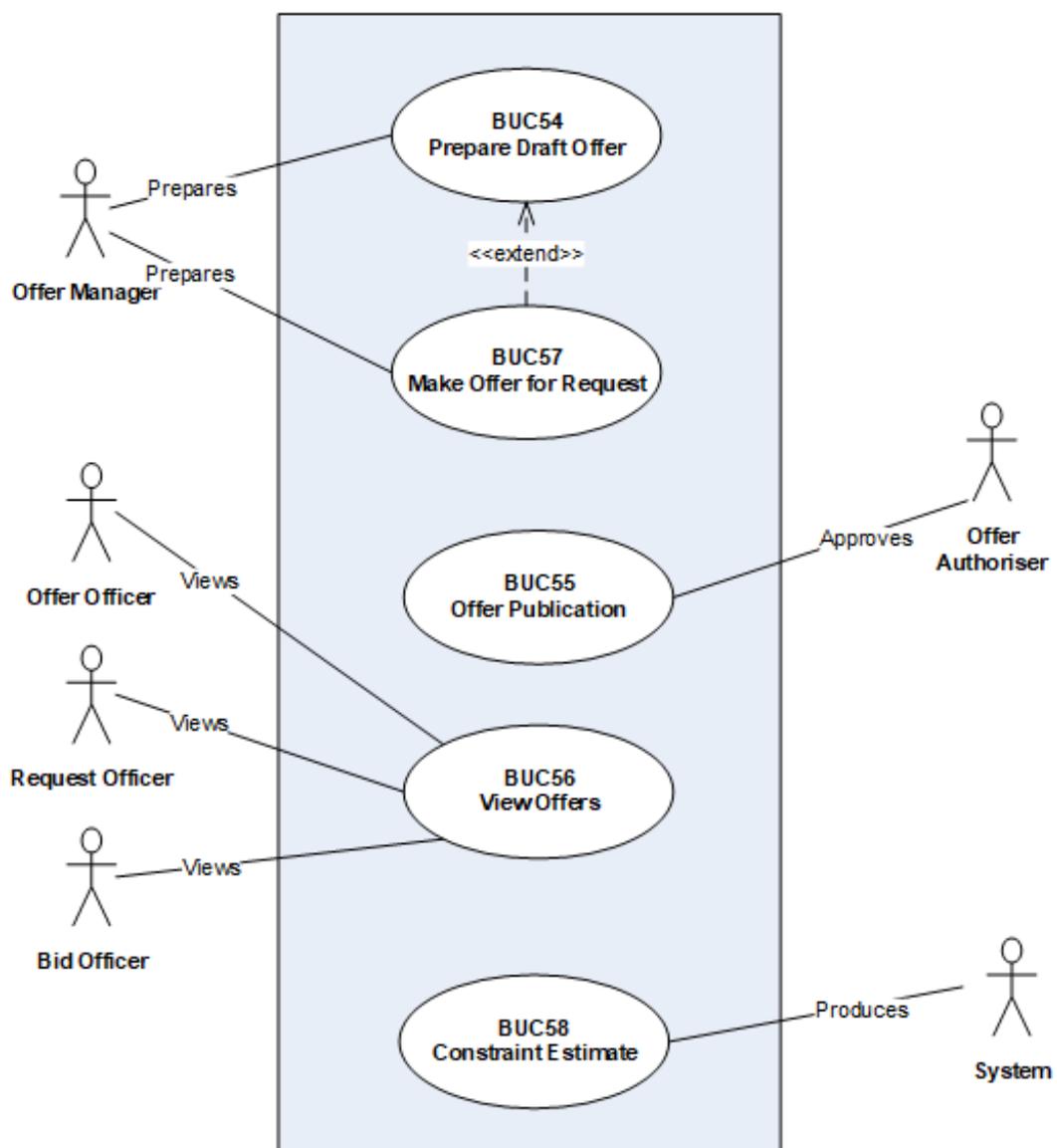
Post: No offer is made.

Business Rules

- R1. A NMF Offer cannot be made for a NMF Request if the NMF Energy Resource being offered is:
 - Already committed during any part of the delivery period in the NMF Request.
 - Does not match the voltage rating of the NMF Request.
 - Inconsistent with the NMF Request categorisation.
 - Not within either the region or location topology of the NMF Request.
- R2. An Industry Actor may have multiple standing NMF Offers with overlapping delivery periods. However, incompatibility could arise if any of the overlapping NMF Offers wins an auction.

3.6 Package D: Offers

- 3.6.1 This package contains BUCs concerned with NMF Offers made by the controlling Industry Actor. An NMF Offer consists of one or more NMF Energy Resources plus additional proposed dispatch and commercial information. NMF Offers can either be:
- (i) Standalone, simply offering flexible capacity for sale, or;
 - (ii) Related to an NMF Request, thus aiming to fulfil that request.
- 3.6.2 A standalone Offer can be marked as “standing”, thus enabling automatic matching against any suitable request (see [BUC17 Standing Offers](#)).
- 3.6.3 The diagram below illustrates the relationships between the set of BUCs relating to the NMF Offers. A detailed description of BUC diagrams can be found in the TBBM Guide §6.1.8.



3.6.4 BUC54 Prepare Draft Offer

An Industry Actor may make an offer to sell the flexible energy from one or more of the NMF Energy Resources that they control. An offer consists of the details of the Energy Resources plus pricing and availability information.

Extended by	BUC57 Make an Offer for a Request
Actors	Offer Manager.
Success Criteria	Industry Actor can create an opportunity to monetise a flexible energy resource.
Preconditions	Industry Actor has a registered Energy Resource.
Trigger	Offer Manager decides to draft an NMF Offer.

Main Path

1. Offer Manager navigates to the NMF Offer functionality.
2. Offer Manager has a list of NMF Offers for the Industry Actor.
3. Offer Manager chooses to create new NMF Offer.
4. Offer Manager amends the NMF Offer details.
5. Offer Manager chooses to request publication of the NMF Offer.

Post Conditions

Offer Authoriser has been requested to approve the NMF Offer (see [BUC55 Offer Publication](#)).

Alternative Paths

1a. New Offer for a Request

- 1a1. Offer Manager has navigated via [BUC57 Make an Offer for a Request](#)
- 1a2. Resume at step 4.

3a. Amend Offer

- 3a1. Offer Manager selects an existing draft NMF Offer.

4a. Save for later

- 4a. Offer Manager chooses to save the draft and continue later.

Post: Draft NMF Offer is available for further work.

4b. Add Energy Resource

- 4b1. Offer Manager selects an NMF Energy Resource from the Industry Actor's holding.
Resume at step 4.

4c. Remove Energy Resource

- 4c1. Offer Manager selects to remove an NMF Energy Resource from the NMF Offer. Resume at step 4.

4d. Set Standing Offer

- 4d1. Offer Manager chooses to set the NMF Offer as a standing offer.

4d1a. Unset Standing Offer

Offer Manager chooses to unset the NMF Offer as a standing offer.

- 4d2. Resume at step 4.
- 4e. Withdraw Offer
 - 4e1. Offer Manager requests that the published NMF Offer be withdrawn.
Post. Follow BUC55 Offer Publication
- 4f. Associate with a Request
 - 4f1. Offer Manager selects a published NMF Request.
 - 4f1a. Remove association with a Request
 - 4f1a1. Offer Manager removes the association with the NMF Request.
 - 4f1b. Request already has an Offer
 - 4f1b1. Offer Manager is warned that the NMF Request selected already has a NMF Offer underway for their Industry Actor.
 - 4f2. Resume at step 4.
- 4g. Offer Categorisation
 - 4g1. Offer Manager selects one or more categorisation items to append to the NMF Offer.
 - 4g1a. Remove categories
 - 4g1a1. Offer Manager removes one or more categorisation items from the NMF Offer.
 - 4g2. Resume at step 4.
- 4h. Supporting documents
 - 4h1. Offer Manager adds supporting documents to the NMF Offer.
 - 4h1a. Remove documents
 - 4h1a1. Offer Manager removes a document from the NMF Offer.
 - 4h2. Resume at step 4.
- 4i. Commentary
 - 4i1. Offer Manager adds a comment to the NMF Offer blog.
 - 4i2. Resume at step 4.

Business Rules

- R1. A given Energy Resource may appear only once in the NMF Offer.
- R2. An NMF Offer cannot be withdrawn after completion of an auction if at least one bid has been made.
- R3. Events occurring during the life cycle of the NMF Offer will be recorded in the blog for the offer indicating the timestamp, User that triggered the event and a description or comment.
- R4. The NMF Offer blog will only be visible to Users of the Industry Actor making the offer and NMF Auditors.

3.6.5 BUC55 Offer Publication

Approval decision to publish or withdraw a NMF Offer.

Extend/Include	None
Actors	Offer Authoriser
Success Criteria	The Industry Actor can make an offer that increases energy market flexibility, or withdraw an offer that no longer meets business needs.
Preconditions	Offer Authoriser has received a request to publish (or withdraw) an NMF Offer.
Trigger	Offer Authoriser decides to review and approve the request.

Main Path

1. Offer Authoriser navigates to the NMF Offer functionality.
2. Offer Authoriser has a list of their Industry Actor's NMF Offers.
3. Offer Authoriser selects to the relevant NMF Offer.
4. Offer Authoriser approves the publication of the NMF Offer.

Post Conditions

The NMF Offer is visible to other Industry Actors.

Alternative Paths

1a. Offer has been previously selected

1a1. Resume at step 4.

4a. Withdraw offer

Offer Authoriser approves the withdrawal of the NMF Offer.

Post: The NMF Offer is no longer visible to other Industry Actors.

4b. Not approved

4c1. Offer Authoriser makes review comments.

Post: The NMF Bid status is unchanged.

Business Rules

- R1. When approved, all Industry Actors should be informed by correspondence of the Offer.
- R2. When withdrawn, all Industry Actors that have begun or made a bid must be informed by correspondence of the withdrawal of the Offer.
- R3. A withdrawal will cancel an auction for the Offer and any bids already made.
- R4. Once published, the content of a NMF Offer may not be changed in any way except for making comments and invoking a withdrawal.

3.6.6 BUC56 View Offers

An Industry Actor can find, list and view NMF Offers that have been published by other Industry Actors.

Extend/Include	None.
Actors	Request Officer, Offer Officer, Bid Officer (Officer)
Success Criteria	Industry Actors can make themselves aware of available offers of flexible energy.
Preconditions	None.
Trigger	Officer decides to view NMF Offers.

Main Path

1. Officer navigates to the view NMF Offers functionality.
2. Officer has a list of NMF Offers.
3. Officer selects a NMF Offer.
4. Officer views details of the NMF Offer.

Post Conditions

Officer has been able to view a published NMF Offer.

Alternative Paths

4a. Send Correspondence

- 4a1. Officer chooses prepare a correspondence regarding the NMF Offer.
- 4a2. Officer sends the correspondence.

Business Rules

- R1. The correspondence sent by the Officer should automatically include the details of the NMF Offer selected.

3.6.7 BUC57 Make an Offer for a Request

A new draft NMF Offer for a particular NMF Request is prepared through this BUC.

Extends	BUC54 Prepare Draft Offer
Actors	Offer Manager
Success Criteria	Creates an opportunity for the Industry Actor to fulfil a request for flexible energy.
Preconditions	A valid NMF Request has been selected.
Trigger	Offer Manager has chosen to make an NMF Offer for a given NMF Request.

Main Path

1. Offer Manager has a list of NMF Offers belonging to their Industry Actor.
2. Offer Manager selects a NMF Offer to associate with the NMF Request.

Post Conditions

A draft NMF Offer associated with the NMF Request has been created.

Alternative Paths

- 1a. Offer for the Request already exists
 - 1a1. Offer Manager is warned that a NMF Offer for their Industry Actor associated with the NMF Request has already been created.
 - 1a2. Follow BUC54 Prepare Draft Offer for the existing NMF Offer.
- 2a. Create new NMF Offer
 - 1a1. Offer Manager choose to create a new NMF Offer associated with the NMF Request.
- 2b. Duplicate an existing NMF Offer
 - 2b1. Offer Manager selects a NMF Offer to duplicate.
 - 2b2. Follow BUC54 Prepare Draft Offer for the newly populates NMF Offer in association with the NMF Request.

Business Rules

- R1. An Industry Actor may have only a single NMF Offer against an NMF Request.

3.6.8 BUC58 Constraint Estimate

A DSO/ESO may ask the NMF market for an estimate of cost to mitigate a constraint. It can then use this estimate along with other potential mitigations to determine the optimum solution for the constraint.

Extend/Include	None.
Actors	System
Success Criteria	The flexibility market has been able to offer a solution to the constraint.
Preconditions	None.
Trigger	A message from WSC requesting an estimate of cost for mitigating a constraint.

Main Path

1. System acknowledges the message.
2. System determines that the constraint is consistent with a standing NMF Offer.
3. System generates an estimate based on the standing NMF Offer.
4. System determines that there are no other applicable standing NMF Offers.
5. System creates an output message summarising the available standing NMF Offers.
6. System sends a message to the WSC containing the offer summary.

Post Conditions

The NMF market has provided an estimate summary for WSC.

Alternative Paths

- 1a. Invalid message
 - 1a1. System replies to the message stating the errors.

Post: No estimate is created.
- 4a. More valid standing NMF Offers
 - 4a1. Resume at step 2.

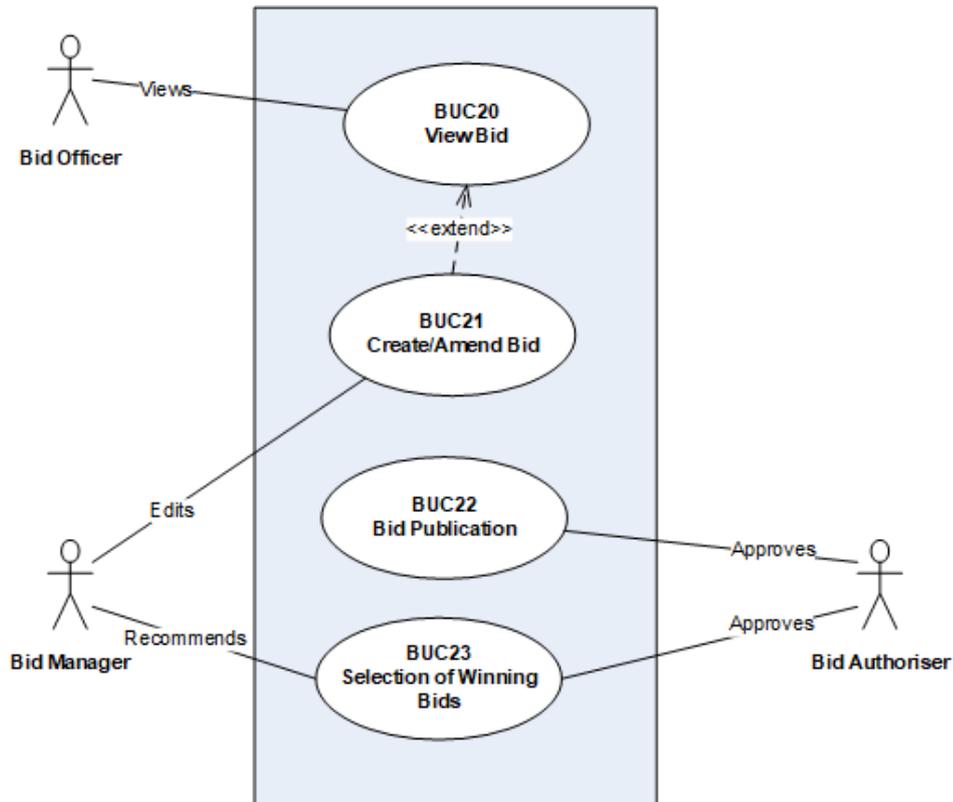
Business Rules

- R1. Only standing NMF Offers which are not already committed for the constraint period will be proposed in the estimate.
- R2. Factors that must be evaluated for determining that an NMF Offer is consistent with a constraint should include:
 - Location proximity to the constraint
 - Market Categories that match the needs of the constraint
 - Start time and duration of the NMF Offer with respect to the constraint
 - Notification period of the NMF Offer
- R3. The consistency determination should result in a compatibility rating for the estimate.
- R4. The summary estimate will contain:
 - Constraint identifier
 - For each NMF Offer: Location, Categorisation, Capacity, Start time, Duration, Compatibility Rating, Costs, Reliability.

3.7 Package E: Bids

3.7.1 An Industry Actor may offer to sell their flexible energy capability in the NMF market by publishing an NMF Offer. Other Industry Actors may then make an NMF Bid for the offering. Bidding continues for a time period specified in the NMF Offer. At the end of the bidding period the Industry Actor making the offer selects the bid(s) that they favour.

3.7.2 The diagram below illustrates the relationships between the set of BUCs relating to NMF Bids and the selection of winning bid(s). A detailed description of BUC diagrams can be found in the TBBM Guide §6.1.8.



3.7.3 BUC20 View Bid

Provides the functionality to allow Industry Actors to access all their bids.

Extended by	BUC21 Create/Update Bid
Actors	Bid Officer
Success Criteria	The Industry Actor is able access functionality to manage all their draft and published bids.
Preconditions	None.
Trigger	Bid Officer navigates to this BUC.

Main Path

1. Bid Officer has a list of NMF Bids raised by their Industry Actor.
2. Bid Officer selects a NMF Bid to view.
3. Bid Officer views the selected NMF Bid.

Post Conditions

Bid Officer sees the content of selected bid.

Alternative Paths

- 1a. Pre-selected bid
 - 1a1. Bid Officer has previously selected a bid to view. Resume at step 2.
- 2a. Create a new bid
 - 2a1. Bid Manager selects an NMF Offer against which to bid.
 - 2a2. Bid Manager follows BUC21 Create/Update NMF Bid
- 3a. Update bid
 - 3a1. Bid Manager follows BUC21 Create/Update NMF Bid using the selected bid.

Business Rules

- R1. By default, the initial list of NMF Bids will be those currently in progress against active offers.

3.7.4 BUC21 Create/Update Bid

This BUC provides for the core functionality to prepare a NMF Bid.

Extends	BUC20 View NMF Bid
Actors	Bid Manager
Success Criteria	The Industry Actor is able to seek to increase the value of their energy resource.
Preconditions	There is a NMF Offer for which an auction is underway. For a new bid, the target NMF Offer has been previously selected.
Trigger	Bid Manager has navigated to this BUC.

Main Path

1. Bid Manager changes the content of the NMF Bid.

Post Conditions

A draft NMF Bid has been updated.

Alternative Paths

1a. New bid

- 1a1. Bid Manager has an empty NMF Bid for a previously selected NMF Offer. Resume at step 1.

1b. Save for later

- 1b1. Bid Manager saves their work to continue at a later time. Return to calling BUC.

1c. Mark NMF Bid for Publishing

- 1c1. Bid Manager marks the NMF Bid as ready for publishing.

Post: Resume in parent BUC.

1d. Mark NMF Bid for withdrawal

- 1d1. Bid Manager marks the NMF Bid for withdrawal.

Post: Resume in parent BUC.

1e. Mark NMF Bid as closed

- 1e1. Bid Manager selects an outcome.

Post: Resume in parent BUC.

1f. Commentary

- 1f1. Bid Manager adds a comment to the NMF Bid blog.

1f2 Resume at step 1.

Business Rules

- R1. When an NMF Bid is marked ready for publishing, a correspondence should be sent to the Bid Authoriser asking for approval.
- R2. When an NMF Bid is marked for withdrawal, a correspondence should be sent to the Bid Authoriser asking for approval.

- R4. Once published, the content of a NMF Bid may not be changed in any way except following a withdrawal. A NMF Bid may be amended after withdrawal and re-submitted for publishing.
- R5. Events occurring during the life cycle of the NMF Bid will be recorded in the blog for the bid indicating the timestamp, User that triggered the event and a description or comment.
- R6. The NMF Bid blog will only be visible to Users of the Industry Actor making the bid and NMF auditors.

3.7.5 BUC22 Bid Publication

Approval decision to publish or withdraw an NMF Bid.

A bid can be withdrawn at any point during a NMF market auction. It also provides the first step to a bid being re-published with, for example, improved terms as a result of better bids from competitors in the auction.

Extend/Include	None
Actors	Bid Authoriser
Success Criteria	The Industry Actor is able to purchase appropriate energy flexibility to satisfy a business need.
Preconditions	Bid Authoriser has received a request to publish (or withdraw) an NMF Offer.
Trigger	Bid Authoriser decides to review and approve the request.

Main Path

1. Bid Authoriser navigates to the NMF Bid functionality.
2. Bid Authoriser has a list of their Industry Actor's NMF Bids.
3. Bid Authoriser selects to the relevant NMF Bid.
4. Bid Authoriser approves the publication of the NMF Bid.

Post Conditions

The NMF Bid is published against the NMF Offer.

Alternative Paths

- 1a. Bid has been previously selected
 - 1a1. Resume at step 4.
- 4a. Withdraw bid
 - 4a1. Bid Authoriser approves the withdrawal of the NMF Bid.

Post: The NMF Bid is no longer visible to other Industry Actors.
- 4b. Bid is not valid
 - 4b1. Bid Authoriser is warned on the issue.

Post: The NMF Bid is not published.
- 4c. Not approved
 - 4c1. Bid Authoriser makes review comments.

Post: The NMF Bid status is unchanged.

Business Rules

- R1. When approved/withdrawn, the Industry Actor making the NMF Offer should be informed by correspondence.
- R2. If a bid has been published but the Industry Actor wishes to amend it, for example to improve its competitiveness against other bidders, then the published bid must be withdrawn prior to publishing the new bid.

R3. Reason for a bid being no longer valid could for example include:

- The auction end date/time has passed
- The Industry Actor already has a published bid for the NMF Offer
- The NMF Offer has been withdrawn

R4. A NMF Bid may not be withdrawn after the NMF Offer auction end date/time.

R5. A NMF Bid that has been withdrawn may be amended and re-published.

Observation

Consideration needs to be given to rules preventing “gaming” of the NMF market. For example, placing bids with exceptional values early in an auction to deter rival bids but with no intention of honouring the commitment of the “false” bid. Such a bid could be withdrawn at the last minute and replaced with the “real” bid, but allow competitors little time to respond.

3.7.6 BUC23 Selection of Winning Bids

The choice of a winning bid(s) is entirely a matter for the Industry Actor publishing the NMF Offer. There is no requirement that the award is based purely on price, as might be the case for a conventional auction. This is because the selection criteria may be more complex than a simple auction. For example, selectors might be willing to accept a higher price of a bid that better supported their environmental objectives.

Extend/Include	None
Actors	Offer Manager, Offer Authoriser
Success Criteria	Migrating action against a risk to the electricity network and supply has been successful.
Preconditions	The auction deadline for a NMF Offer has passed.
Trigger	Offer Manager decides to select a winning bid.

Main Path

1. Offer Manager selects the NMF Offer needing winning bid selection.
2. Offer Manager is able to view each NMF Bid.
3. Offer Manager marks each NMF Bid that is proposed as a winner.
4. Offer Manager requests approval for the winning NMF Bids.
5. Offer Authoriser approves the winning NMF Bids.

Post Conditions

The winning NMF Bids have a contract to supply their energy resource bid to the NMF Offer owner.

Alternative Paths

1a. Pre-selected offer

- 1a1. Offer Manager has already selected the NMF Offer. Resume at step 2.

3a. No successful bids

- 3a1. Offer Manager makes a comment regarding the reason no NMF Bid has been successful.
- 3a2. Offer Manager request approval for the no-win outcome.
- 3a3. Offer Authoriser approves the no-win outcome.

3a3a. Approval withheld

- 3a3a1. Offer Authoriser makes a comment regarding the rejection reason.
Resume at step 2.

Post: No winners are announced.

5a. Approval withheld

- 5a1. Offer Authoriser makes a comment regarding the rejection reason. Resume at step 2.

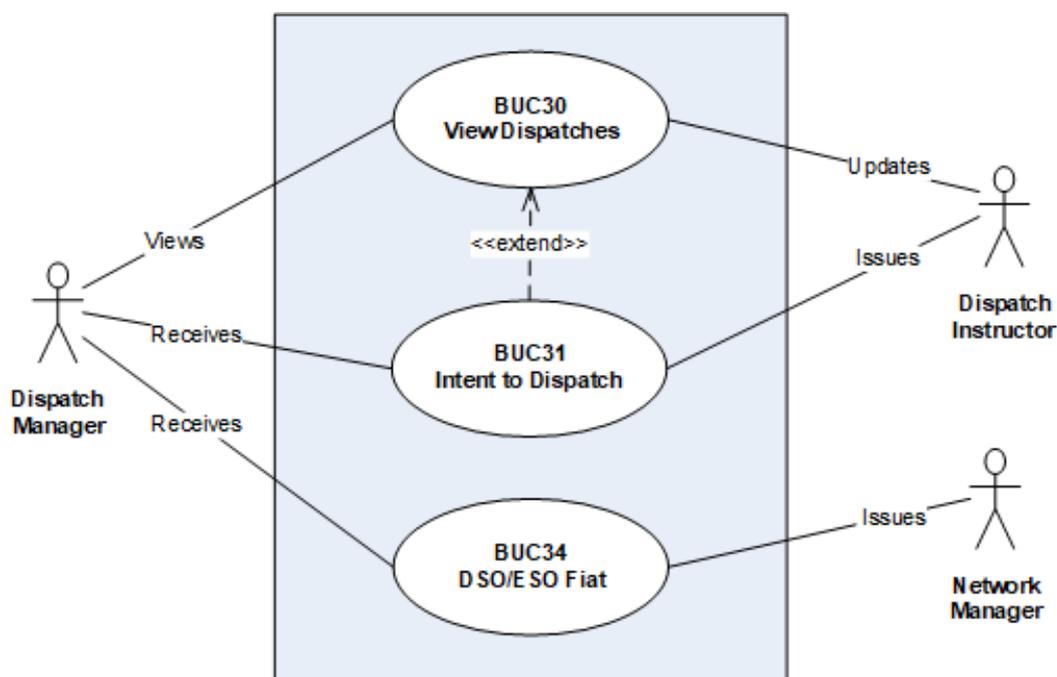
Business Rules

- R1. Offer Manager's request for approval is made via a correspondence.
- R2. Offer Authoriser's decision is made via a correspondence.

- R3. Each Industry Actor which has a bid at the end of the auction is notified of the success or failure of their NMF Bids.

3.8 Package F: Dispatch

- 3.8.1 Once a winning offer or bid has been determined in the NMF market, the dispatch of capacity (increase/decrease in power or uplifted/reduced demand) in relation to the offer follows. The processes that orchestrate the dispatch have two key roles:
- Dispatch Instructor, a role held by the Industry Actor that purchased the flexible capacity (either the NMF Request or the NMF Bid);
 - Dispatch Manager, a role held by the Industry Actor that offered the flexible capacity to the market (the NMF Offer).
- 3.8.2 These roles perform two processes to arrange and complete each dispatch:
- Each dispatch must be initiated by the Dispatch Instructor with a NMF Intent to Dispatch before the notice period of the NMF Offer. Amended NMF Intent to Dispatch may be issued if necessary;
 - A statement giving proof of the dispatch is by the Dispatch Manager and submitted back to the NMF Request owner for settlement.
- 3.8.3 The dispatch BUCs also apply to NMF Bi-lateral Contract dispatches. In this event the Dispatch Instructor role is also performed by the Industry Actor that has the Dispatch Manager role.
- 3.8.4 The diagram below illustrates the relationships between the set of BUCs relating to dispatch in the NMF system. A detailed description of BUC diagrams can be found in the TBBM Guide §6.1.8.



3.8.5 BUC30 Dispatch

This BUC covers viewing and actions for normal NMF dispatches.

Extended by	BUC31 Intent to Dispatch
Actors	Dispatch Instructor, Dispatch Manager
Success Criteria	Industry Actors understands their commitments to dispatches.
Preconditions	Industry Actor has made a successful request, offer or bid in the NMF market.
Trigger	Actor decides to view NMF Dispatch functionality.

Main Path

1. Actor navigates to the Dispatch functionality.
2. Actor has a list of NMF Dispatches.
3. Actor selects a NMF Dispatch.
4. Actor has details of the NMF Dispatch.

Post Conditions

Changes made to NMF Dispatches have been recorded.

Alternative Paths

1a. NMF Dispatch has been provided

- 1a1. Actor resumes at step 4.

3a. Create a new NMF Dispatch

- 3a1. Dispatch Instructor chooses to create a new NMF Dispatch.
- 3a2. Dispatch Instructor has default NMF Dispatch details based in the related NMF Offer.
Resume as step 4a.

3b. Navigates away

- 3b1. Actor navigates away from the NMF Dispatch functionality. Resume at Post Conditions.

4a. Update NMF Dispatch details

- 4a1. Dispatch Instructor amends the NMF Dispatch details.

Post: Resume at step 3.

4b. Save for later

- 4b1. Dispatch Instructor chooses to save the details of an NMF Dispatch for amendment at a later time.

Post: Resume at step 3.

4d. Specify Energy Resources

- 4d1. Dispatch Instructor selects the NMF Energy Resources from the NMF Offer for the NMF Dispatch. Resume at step 4.

4d1a. Energy Resource Options

- 4i1a1. Dispatch Instructor chooses specific options made available by the NMF Offer for the NMF Energy Resource. Resume at step 4.

- 4e. View Dispatch History
- 4e1. Actor selects a dispatch history events.
- 4e2. Actor views the details of the dispatch history event. Resume at step 4.
- 4f. Issue NMF Intent to Dispatch
- 4f1. Dispatch Instructor chooses to raise a NMF Intent to Dispatch. Follow BUC31 Intent to Dispatch
- 4g. Issue a Proof of Dispatch
- 4g1. Dispatch Manager chooses to raise a NMF Proof of Dispatch.
- 4g2. Dispatch Manager provides details for the NMF Proof of Dispatch.
- 4g2a. Attach documents
- 4g1. Dispatch Manager attaches a document(s) giving proof of dispatch details. Resume at step 4g2.
- 4g3. Dispatch Manager chooses to issue the NMF Proof of Dispatch. Resume at step 4.
- 4h. No dispatch required
- 4h1. Dispatch Instructor chooses to cancel the proposed NMF Dispatch.
- 4h1a. Rescind cancellation
- 4h1a1. Dispatch Instructor rescinds the cancellation. Resume at step 4.
- 4h2. Dispatch Instructor provides a reason for the cancellation.
- 4h3. Dispatch Instructor issues the cancellation instruction to the Dispatch Manager. Resume at step 3.

Business Rules

- R1. For a Dispatch Manager, the list of NMF Dispatches should by default include, in order of priority, NMF Dispatches which:
- Have received a current NMF Intent to Dispatch
 - Are within the notice period of the NMF Intent to Dispatch
 - Are being dispatched
 - Have been dispatched and await the issuing of a NMF Proof of Dispatch
 - NMF Offers that may receive a valid Intent to Dispatch message
- R2. For a Dispatch Instructor, the list of NMF Dispatches should by default include, in order of priority, NMF Dispatches which:
- Are due to be sent a NMF Intent to Dispatch
 - NMF Requests or NMF Bids which could validly be sent a NMF Intent to Dispatch but are not specifically due
- R3. Overdue actions in the list of NMF Dispatches should be highlighted.
- R4. There should be a default time lag after an auction selection that determines when a notification period of a NMF Dispatch may begin. Each Industry Actor may vary this according to their needs.
- R5. An NMF Dispatch may not exceed the terms of the related NMF Offer.
- R6. The NMF Dispatch details may vary the NMF Offer values within the limits of the NMF Offer provided that the new values are technically viable and commercially reasonable for the Industry Actor providing the flexible power.

- R7. Dispatch history events for an NMF Dispatch is any of previously issued:
- NMF Intent to Dispatch
 - NMF Proof of Dispatch
 - No dispatch notification
- R8. Most NMF Dispatch details may not be altered after the start of the notification period of the NMF Offer. Exceptions include:
- No dispatch notification, until the end of the dispatch duration
 - Proof of dispatch documents and issuing, after the dispatch duration is complete
- R9. By default, all NMF Energy Resources for an NMF Offer are selected for a NMF Dispatch.

3.8.6 BUC31 Intent to Dispatch

Whenever an Industry Actor that purchased flexible capacity (through an NMF Request, NMF Bid or NMF Bi-lateral Contract) wishes to make use of that flexible capacity, they must first issue a NMF Intent to Dispatch. This is sent to the Industry Actor owning the flexible capacity and other interested parties to warn of a dispatch. See §3.8.1.

Extends	BUC30 Dispatch
Actors	Dispatch Instructor, Dispatch Manager
Success Criteria	Relevant Industry Actors are made aware of the likely dispatch. The Industry Actor controlling the relevant Energy Resource(s) can ensure that the dispatch can be made when instructed. Other Industry Actors can check if the dispatch has a significant impact on their operations.
Preconditions	An Industry Actor has made a successful offer/bid in the NMF market.
Trigger	Dispatch Instructor decides to initiate a dispatch of capacity.

Main Path

1. Dispatch Instructor confirms the NMF Intent to Dispatch details.
2. Dispatch Instructor issues the NMF Intent to Dispatch Manager.
3. Dispatch Manager receives the NMF Intent to Dispatch.
4. Dispatch Manager begins preparations for the dispatch.

Post Conditions

The dispatch of flexible power has been arranged.

Alternative Paths

1a. Attach notes

- 1a1. Dispatch Instructor attaches a note(s) for the Dispatch Manager regarding a NMF Intent to Dispatch. Resume at step 1.

4a. NMF Intent to Dispatch is inconsistent with NMF Offer

- 4a1. Dispatch Manager contacts Dispatch Instructor immediately to agree a solution.

Post: Dispatch Instructor should remedy the problem.

4b. Dispatch cannot be executed

- 4b1. Dispatch Manager contacts Dispatch Instructor immediately to agree a solution.

Post: Dispatch Instructor may need to seek an alternative solution.

Business Rules

- R1. A NMF Intent to Dispatch may be inconsistent with a NMF Offer for a number of reasons, including:
 - Outside the scope of the NMF Offer;
 - Arrived too late as defined by the notice period in the NMF Offer.
- R2. The inability to complete a dispatch as per the NMF Offer could occur, for example, due to mechanical failure of the NMF Energy Resource.
- R3. The NMF system will send details of the dispatch intention to:
 - WSC of each DSO impacted by the dispatch

- WSC of ESO
 - All other Industry Actors which are a BRP and impacted by the dispatch
- R4. A NMF Intent to Dispatch should be issued at least 24 hours prior to the notification time in the NMF Offer.
- R5. A NMF Intent to Dispatch may be re-issued with updated terms provided it does not contravene R4.
- R6. The success or failure to execute a dispatch as instructed may impact the Industry Actors reliability rating.

Observation

Market rules for reliability calculations are expected to be defined by SSEN and Origami through TRANSITION Work Package 4.

3.8.7 BUC34 DSO/ESO Fiat Instruction

The DSO of a given network has a responsibility to ensure that their network operates in a safe and stable manner. On rare occasions it is possible that the DSO determines that the actions (or potential actions) of an Industry Actor may threaten that safety and/or stability. To mitigate the risk or issue, the DSO may send a demand to an Industry Actor(s) to perform specific actions, for example to immediately start, change or cease a dispatch. This fiat instruction will override commercial considerations. The same capability should also be available to ESO.

Extend/Include	None.
Actors	Network Manager, Dispatch Manager
Success Criteria	The DSO/ESO electricity supply network continues to function in a safe and stable manner.
Preconditions	A risk or issue to the DSO/ESO network has been identified.
Trigger	Network Manager decides that a fiat instruction is necessary.

Main Path

1. Network Manager raises and sends the fiat instruction.
2. Dispatch Manager receives the fiat instruction.
3. Dispatch Manager arranges for the fiat instruction to be implemented.

Post Conditions

The response to the fiat instruction has been started.

Alternative Paths

3a. Invalid fiat instruction

3a1. Dispatch Manager immediately contacts Network Manager to resolve the matter.

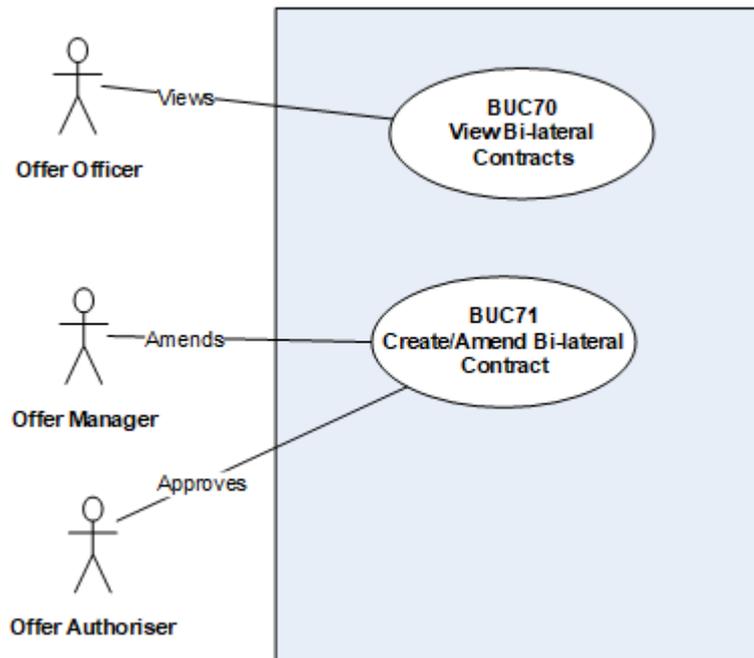
Post: A resolution has been reached.

Business Rules

- R1. An invalid fiat instruction could, for example, be due to it being issued to the wrong Industry Actor.
- R2. The fiat instruction correspondence should be copied to all DSOs and the ESO.

3.9 Package G: Bi-lateral Contracts

- 3.9.1 In order to achieve accurate forecasting in the flexible energy market, information from contracts for flexible energy agreed prior to registration to the NMF system needs to be recorded. The intent of these BUCs is to allow an Industry Actor to provide this in a way that is consistent with the NMF data structures and ethos but doesn't reveal any other commercially sensitive information.
- 3.9.2 The diagram below illustrates the relationships between the set of BUCs relating to the input of flexible energy bi-lateral contract information undertaken by an Industry Actor. A detailed description of BUC diagrams can be found in the TBBM Guide §6.1.8.



3.9.3 BUC70 View Bi-lateral Contracts

Any bi-lateral contracts held by an Industry Actor are accessed by this BUC. It also provides the gateway to create new bi-lateral contracts and amend the details of existing bi-lateral contracts.

Extended by	BUC71 Create/Update Bi-lateral Contract.
Actors	Offer Officer, Offer Manager
Success Criteria	Industry Actor can view their NMF Bi-lateral Contracts and has access to tools to manage their NMF Bi-lateral Contracts.
Preconditions	None.
Trigger	Offer Officer decides to view NMF Bi-lateral Contracts.

Main Path

1. Offer Officer navigates to the NMF Bi-lateral Contracts functionality.
2. Offer Officer has a list of NMF Bi-lateral Contracts belonging to their Industry Actor.
3. Offer Officer selects a NMF Bi-lateral Contract.
4. Offer Officer views the details of the selected NMF Bi-lateral Contract.

Post Conditions

Offer Officer has been able to view the details of the relevant NMF Bi-lateral Contract.

Alternative Paths

1a. Bi-lateral Contract has been provided

1a1. Continue at step 4.

3a. Create new Bi-lateral Contract

3a1. Offer Manager chooses to create a new NMF Bi-lateral Contract.

3a2. Offer Manager has an empty NMF Bi-lateral Contract.

3a3. Offer Manager follow BUC71 Create/Update Bi-lateral Control

Post: A new NMF Bi-lateral Contract has been created.

4a. View Energy Resource

4a1. Offer Officer selects an NMF Energy Resource to view.

4a2. Offer Officer has the details of the NMF Energy Resource. Resume at step 4.

4b. View Dispatches

4a1. Offer Officer selects an NMF Dispatch to view.

4a2. Offer Officer has the details of the NMF Dispatch. Resume at step 4.

Business Rules

- R1. NMF Bi-lateral Contracts are only visible to the owning Industry Actor and Auditors.

3.9.4 BUC71 Create/Update Bi-lateral Contract

Allows the Industry Actor to create and amend their bi-lateral contracts recorded in the NMF system. Details of a bi-lateral contract must be approved before dispatches can commence.

Extends	BUC70 View Bi-lateral Contracts
Actors	Offer Manager, Offer Authoriser
Success Criteria	Industry Actor is able to record bi-lateral contract information in the NMF system without revealing commercially sensitive information.
Preconditions	Industry Actor has entered into a contract for delivery of flexible power outside of the NMF system.
Trigger	Offer Manager has chosen to create or amend a NMF Bi-lateral Contract.

Main Path

1. Offer Manager amends the NMF Bi-lateral Contract details.

Post Conditions

Offer Manager resumes in BUC70.

Alternative Paths1a. Save for later

- 1a. Offer Manager chooses to save the draft and continue later.

Post: Draft NMF Bi-lateral Contract is available for further work.

1b. Add Energy Resource

- 1b1. Offer Manager selects an NMF Energy Resource from the Industry Actor's holding.
Resume at step 1.

1c. Remove Energy Resource

- 1c1. Offer Manager selects to remove an NMF Energy Resource from the NMF Bi-lateral Contract. Resume at step 1.

1d. Mark as completed

- 1d1. Offer Manager marks the NMF Bi-lateral Contract as having been completed.

1e. Reopen completed bi-lateral contract

- 1e1. Offer Manager removes the completed mark from the NMF Bi-lateral Contract.

1f. Request approval of bi-lateral contract details

- 1f1. Offer Manager requests approval for the NMF Bi-lateral Contract.

1g. Approval of bi-lateral contract details

- 1g1. Offer Authoriser marks the NMF Bi-lateral Contract as approved.

1g1a. Not approved

- 1g1a1. Offer Authoriser marks the NMF Bi-lateral Contract as not approved.

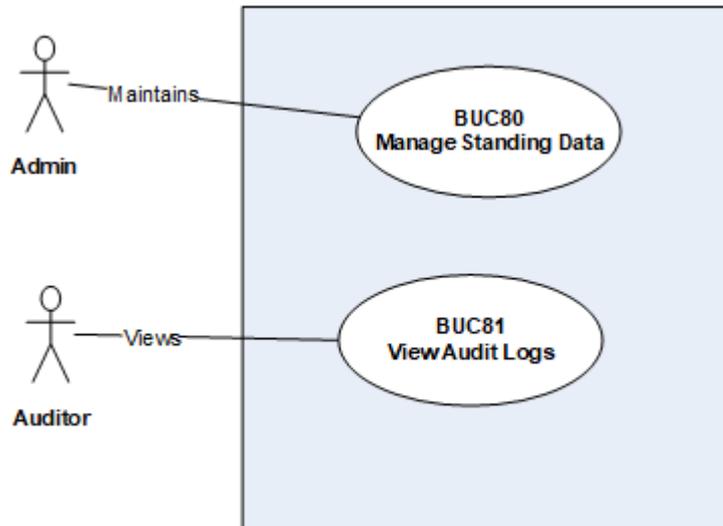
Business Rules

- R1. Once marked as completed, the only change that can be made to the NMF Bi-lateral Contract is to reopen it.

- R2. An NMF Bi-lateral Contract must be approved before related dispatches can be made.
- R3. An approval request will be sent as a correspondence to the Offer Authoriser.

3.10 Package H: Miscellaneous

3.10.1 This package contains various BUCs which don't have a clear home in any of the other packages. The diagram below illustrates the relationship between these BUCs. A detailed description of BUC diagrams can be found in the TBBM Guide §6.1.8.



3.10.2 BUC80 Manage Standing Data

Various standard codes and associated data are used in NMF system. These standing data need to be maintained over the long term to accommodate changes when they occur.

Extend/Include	None.
Actors	Admin.
Success Criteria	NMF system continues to function correctly following the standing data amendments.
Preconditions	None.
Trigger	Admin navigates to the standing data management capability.

Main Path

1. Admin selects the data set to be managed.
2. Admin selects a data item from a list of items.
3. Admin changes the selected data item.
4. Admin sees the changed data item in the list.

REPEAT 2 to 4 until changes complete.

Post Conditions

All changes to the chosen data set are completed.

Alternative Paths2a. Add a data item

- 2a1. Admin chooses to create a new data item.
- 2a2. Admin enters the date on which the data item comes into use.
- 2a3. Admin enters the data items details.
- 2a4. Admin sees the new item in the list. Resume at step 2.

2b. Mark a data item as not used

- 2b1. Admin provides the last date on which the data item is to be used.
- 2b2. Admin sees the marked data item in the list. Resume at step 2.

Business Rules

- R1. In general the maintenance of standing data should be easy to use by a non-technical specialist and not require a service request.
- R2. The standing data that should be amended through this process, including:
 - Market Categories
 - Locations
 - Parameters governing NMF system functionality, for example minimum auction period

3.10.3 BUC81 View Audit Log

This BUC provides for a means by which an auditor can examine all actions affecting NML.

Extend/Include	None.
Actors	Auditor.
Success Criteria	Auditor has gained an appropriate understanding of the history of changes made in the NMF system.
Preconditions	Auditor has a need to review the audit log of one or more aspects of the NMF system.
Trigger	Auditor navigates to the audit log viewing capability.

Main Path

1. Auditor selects an audit log to review.
2. Auditor views the content of the audit log.

Post Conditions

Auditor has found the audit data sought.

Alternative Paths2a. Sort/filter audit log list

2a1. Auditor chooses criteria to sort and/or filter the audit log. Resume at Main Path 2.

2b. Export audit log

2b1. Auditor chooses to export the audit log with the current sort/filter criteria applied to a file on their workstation. Resume at Main Path 2.

Business Rules

- R1. Default is most recent action first.
- R2. Should include:
 - Sequence number
 - Date/time
 - User identifier
 - Function used
 - Action performed
 - Data item(s) impacted (eg field label, document ID)
- R3. Before/after values for data items are not required.

4 Management Reports

4.1 Introduction

4.1.1 This chapter outlines the management reporting requirements for NMF. It is organised into two sections:

- a) The Use Cases section gives the BUCs illustrating the functional elements of producing management reports within the NMF system.
- b) The Required Reports section outlines the content of the required management reports.

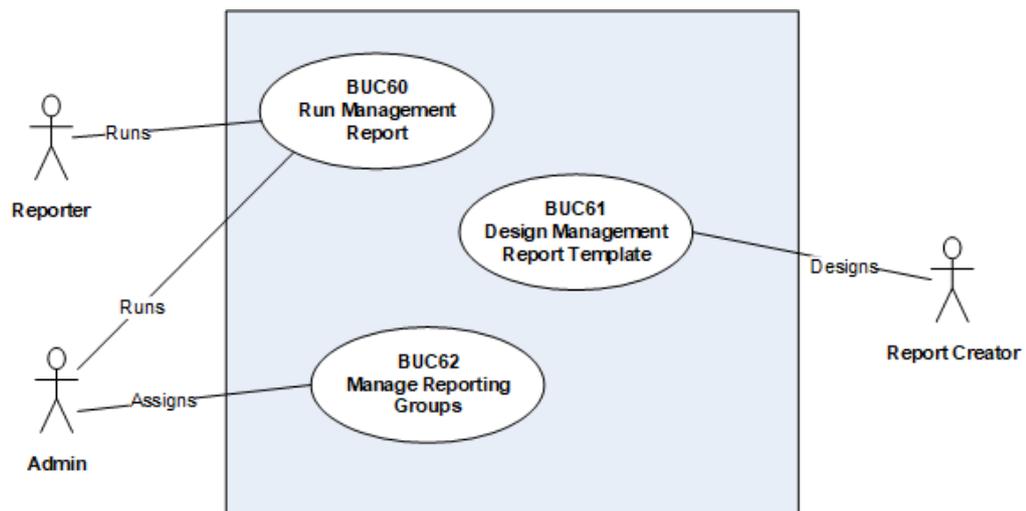
4.2 Required Reports

4.2.1 Capacity Summary

4.2.1.1 Periodic summary by Industry Actor and Energy Resources.

4.3 Use Cases

4.3.1 The diagram below illustrates the relationships between the set of BUCs relating to NMF management reporting.



4.3.2 BUC60 Run Management Report

Complex reports, statistical reporting and dashboard type reports need to be produced. This BUC addresses the need for executing these more complex reports as pre-designed templates suitable for use by non-specialist staff.

Extend/Include	None.
Actors	Reporter, Admin.
Success Criteria	Information has been produced that enhances management decision making.
Preconditions	A management report is needed.
Trigger	Reporter navigates to the Management Reports capability.

Main Path

1. Reporter selects report template to run.
2. Reporter enters run time criteria.
3. Reporter chooses protective marking for the output.
4. Reporter sees report output.

Post Conditions

The report output is saved for future viewing.

Alternative Paths

- 1a. View saved report
 - 1a1. Reporter selects a previously run report to view its output. Resume at step 3.
- 1b. Delete report
 - 1b1. Reporter selects a previously run report to delete.

Post. The selected report is deleted.
- 2a. Background report
 - 2a1. Reporter chooses to run the report in background.

Post. The report is executed and output saved for future viewing.
- 2b. Future report
 - 2a1. Admin sets a date and time when a report must be run.

Post. Admin can view the report output after it has been run at the designated time.

 - 2a1a. Recurring report
 - 2a1a1. Admin sets a recurring pattern of execution for the report.

Post. Admin can view the report output after each designated execution.
- 4a. Drill down
 - 4a1. Reporter chooses to view details of summary report data. Resume at step 3.
- 4b. Download report
 - 4b1. Reporter chooses a format for the downloaded report.

- 4b2. Reporter has a file containing the report output saved on their workstation. Resume step 3.

Business Rules

- R1. Report output must include the run time criteria used in its execution.
- R2. The default file format for report output is Adobe Acrobat (.pdf). It should also be possible to download in Microsoft Excel format.
- R4. Report criteria options must be presented in a graphical manner and not be dependent on Reporter understanding a query language such as SQL.
- R5. Reporter will only be able to run reports to which they have been granted access (see [BUC61 Design Management Report Template](#)).

4.3.3 BUC61 Design Management Report Template

It is likely that, over time, it will become necessary to create new management report designs.

Extend/Include	None.
Actors	Report Creator (RC).
Success Criteria	A report template becomes available for others to execute.
Preconditions	The specification of a new or amended report template is made available to RC.
Trigger	RC navigates to the management report design capability.

Main Path

1. RC selects a report template from a list of report templates.
2. RC designs the report template.
3. RC chooses a group of reporters with which to share the report template.

Post Conditions

Reporters can produce reports based on the report template.

Alternative Paths

- 1a. Create a report template
 - 1a1. RC chooses to create a new report template. Resume at step 2.
- 1b. Copy a report template
 - 1b1. RC selects an existing report template to copy.
 - 1b2. RC resume at step 2 with the copied design.
- 2a. Withdraw report template
 - 2a1. RC marks the report template as withdrawn.

Post. Reporters can no longer produce reports based on the withdrawn template.
- 3a. Report template is incomplete
 - 3a1. RC chooses not to share the report template.

Post. Revised report template is not available to Reporters.
- 3b. Test a report template
 - 3b1. RC chooses to undertake a test execution of the template.
 - 3b2. RC reviews the output of the tested report template. Resume at step 2.

Business Rules

- R1. The report design capability should be primarily graphical in nature. Both data selection and output presentation design should be performed through a graphical user interface.
- R2. A report designer should not have to have knowledge of SQL, HTML or other data manipulation languages to successfully prepare a report template.
- R3. It should be possible to limit sharing of a report template to named Reporter groups. Reporter groups are those processed through BUC62 Manage Report Groups.

4.3.4 BUC62 Manage Reporting Groups

This BUC addresses the granting of rights to access management report designs by assignment to reporting groups.

Extend/Include	None.
Actors	Admin.
Success Criteria	Individuals have the appropriate level of access to the management reporting capability.
Preconditions	Changes to access rights to management reports are needed.
Trigger	Admin navigates to the management report administration capability.

Main Path

1. Admin selects a reporting group.
2. Admin adds/removes Reporters from the group.

Post Conditions

Reporters have access to the reporting capabilities they have been granted.

Alternative Paths

- 1a. Create reporter group
 - 1a1. Admin chooses to create a new reporting group. Resume at step 2.
- 2a. Drop reporter group
 - 2a1. Admin chooses to drop the reporting group.

Business Rules

- R1. There should always be a Report Creator group which cannot be dropped and grants access to the facilities outlined in BUC61 Design Management Report Template.

5 Non-Functional Requirements

5.1 Volumetrics

5.1.1 Volumetric information is not yet known for the TRANSITION trials. However, it is expected that the trials will only have a small number of Industry Actors and only small volumes of data.

5.2 Audit & Compliance

5.2.1 All additions, changes and deletions of data in the NMF will generate a clear audit trail of the events.

5.2.2 The audit trail(s) must be readily accessible to appropriate reviewers and be provisioned with tools to allow selective analysis.

5.3 Security

5.3.1 Users of NMF are assumed to be accessing the system through a browser from an appropriately secured network and location.

5.3.2 Security aspects of the NMF system will be specified by SSEN.

5.4 Service Management & Continuity

5.4.1 Service management for the TRANSITION trials will be dealt with internally by SSEN.

5.5 Archiving

5.5.1 The TRANSITION trials have no specific data archiving requirements.

5.6 Data Migration

5.6.1 No automated data migration from existing systems to the NMF system is expected for the TRANSITION trials. Any data needed by the NMF system will be dealt with the TRANSITION trials team.

5.7 Training

5.7.1 No specific training is expected to be needed for the TRANSITION trials.

6 Appendices

6.1 TBBM Guide

6.1.1 Overall Structure

6.1.1.1 A Requirement Specification (RS) usually contains three core chapters plus other supporting chapters and appendices as necessary:

- a) As-Is Business Model
- b) To-Be Business Model
- c) Requirements Catalogue

6.1.1.2 The core chapters are described in the following sub-sections.

6.1.2 As-Is Business Model

6.1.2.1 The As-Is Business Model (AIBM) describes the relevant existing business processes within an organisation. The intent is to provide a baseline from which a To-Be Business Model (TBBM) may be developed. The best scenario is that an existing up-to-date AIBM can simply be referenced. Otherwise the AIBM chapter should be finished and approved before the TBBM is written.

6.1.2.2 Where there are no existing business processes, the AIBM is usually minimal.

6.1.2.3 Where there are existing processes it is common that, due to time pressures, the preparation of the AIBM and TBBM overlap once the AIBM is thought to be reasonably well understood.

6.1.2.4 Sections in the AIBM mirror those of the TBBM.

6.1.3 To-Be Business Model

6.1.3.1 The TBBM is the heart of the requirement. It describes the functional business processes, management reports and non-functional requirements needing support by an IT system. Sections usually include:

- a) **Business Context** – defines of the scope boundary of the TBBM and the relationship of the TBBM with the rest of the business and external entities. The section will include a diagram of the context. It will be supported by an Information Exchange Requirement (IER) providing a more detailed analysis of flows of data to and from the scope boundary. The IER is usually a spreadsheet presented as an annex to the RS.
- b) **High Level Process** – a diagram and brief commentary on the major business processes addressed by the TBBM. The intent is to ensure that the reader can see the “big picture”.
- c) **Roles** – the set of business roles needed for the TBBM. These roles play a crucial part in ensuring actions taken in Business Use Cases (BUCs) are attributed to specific groups of people. Roles are central to defining Role Based Access Control (RBAC) for an IT system, influence user training needs and are important in volumetric estimates.

- d) **Domain Model** – a diagram showing the data domain of the TBBM. It provides a different view of the TBBM focused on data structures and relationships. It is particularly important for management reporting and database sizing. The diagramming style is similar to a Universal Modelling Language (UML) Class diagram or, alternatively, a Logical Data Structure diagram. Attributes may be recorded but not methods. The diagram is supported by a description of the entities identified in the diagram.
- e) **Locations** – a description of the physical and network locations which are expected to be impacted by the TBBM. The locations information is important primarily for non-functional aspects of the TBBM such as physical implementations, service management, business change and training.
- f) **Business Use Cases** – BUCs are the core description of TBBM functional business processes requiring IT support. This section consists of a series of use cases divided into logical packages and supported by UML Use Case diagrams. The use cases are written from the perspective of identifying TBBM requirements in a business goal context. They do not specify a technical solution and indeed aim to be solution neutral.
- g) **Workflow** – one or more diagrams illustrating the major business life cycle(s) within the TBBM. The diagrams are in Business Process Modelling Notation v2 (BPMN) style using swim lanes. The BPMN diagrams can be quite extensive and so are normally annexed. The workflow diagrams aim to provide a complimentary view of the TBBM to that provided by the BUCs and the Domain Model.
- h) **Management Reports** – a series of outline specifications of the management reporting required for the TBBM. It normally does not include simple lists for day-to-day operational support which would be specified in the BUCs. Instead this section commonly identifies statistical reporting (including performance indicators and dashboards) supporting senior management decision making.
- i) **Non-Functional Requirement** – this section contains those business requirements which cannot easily be specified as functional requirements (ie in the BUCs) but nonetheless have significance (often global) to the TBBM. Typically this section is divided into various sub-sections, for example:
 - (i) Audit & Compliance
 - (ii) Security
 - (iii) Safety
 - (iv) Service Management & Business Continuity
 - (v) Archiving
 - (vi) Data Migration
 - (vii) Training
 - (viii) Business Change

6.1.4 Requirements Catalogue

- 6.1.4.1 The Requirements Catalogue is a spreadsheet that distils the detail of the TBBM into short, precise statements of requirement. These can then be supplemented with additional information such as prioritisation, solution compliance statements and testing results.
- 6.1.4.2 The purpose of the Requirements Catalogue is to provide an audit trail tracing the compliance of a solution against the requirements specified in the TBBM. It is an

essential tool during procurement of a solution and during the testing phases of the chosen solution.

6.1.5 Context Diagram

6.1.5.1 The Context Diagram is the top level of a Data Flow Diagram. Dating back to the 1960s, this type of diagram is one of the oldest techniques used to analyse IT systems. They featured as one of the core techniques in the UK Government's SSADM approach to analysis in the 1980s and 1990s.

6.1.5.2 For Requirement Specifications, the Context Diagram provides an overarching view of the external circumstances of the subject of the RS. In this sense they provide a way of viewing the scope boundary of the RS. In particular, the Context Diagram outlines how the subject of the RS interacts with external entities through flows of data into and out of the scope boundary.

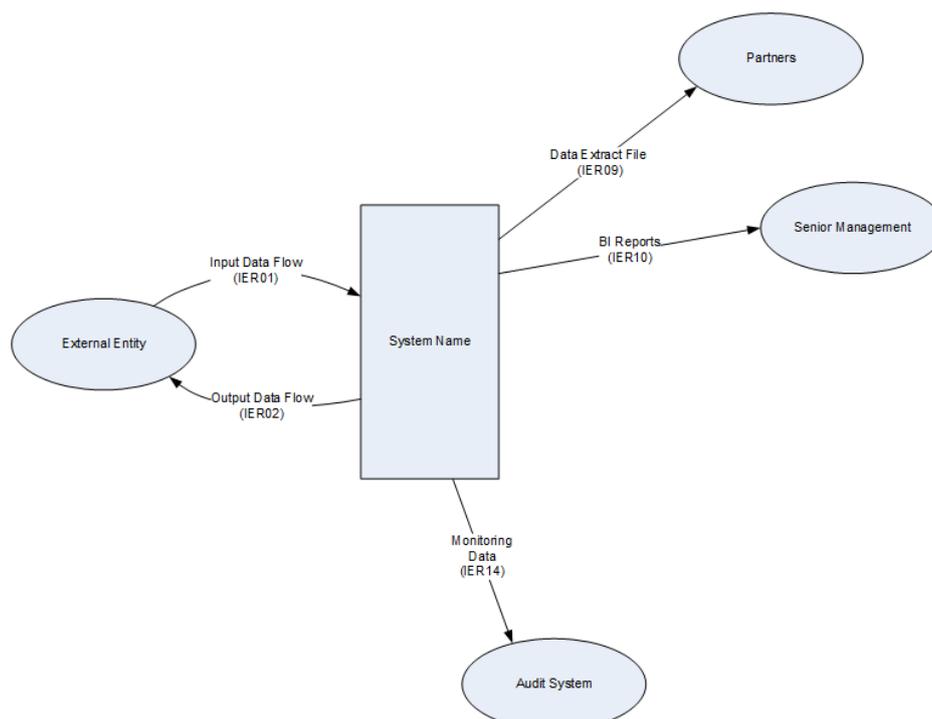
6.1.5.3 A Context Diagram should be supported by descriptions of the external entities in the diagram and the significant flows of data. Data flows might include:

- (i) Correspondences, eg paper documents, emails, reports etc
- (ii) Batch files of data
- (iii) Direct process to process data transfers for real time interactions

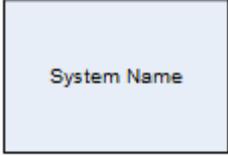
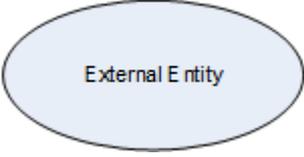
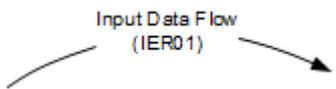
6.1.5.4 The analyst may also choose to support a Context Diagram with an Information Exchange Requirement (IER) to provide a summary of the data flows. This is commonly a spreadsheet provided as an annex to the RS. Where necessary due to quantity or complexity of data flows, a single data flow in the Context Diagram might represent a number of different data items (particularly correspondences) which are fully enumerated in the IER.

6.1.5.5 It is important that each data flow has an associated BUC(s) reference defining the processing and business rules applicable to data flow.

6.1.5.6 The following is an example of a Context Diagram:



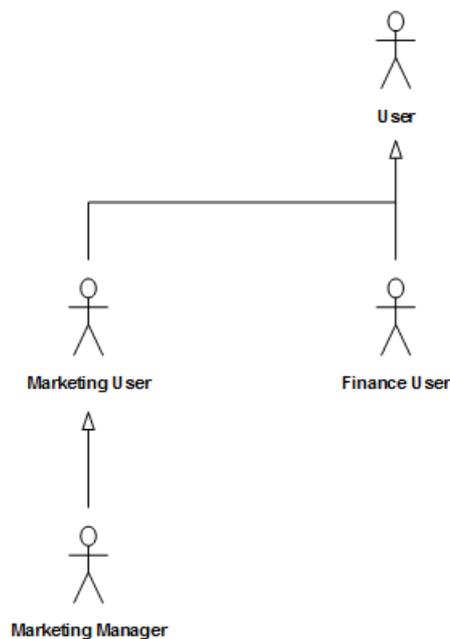
6.1.5.7 The diagram has a very small number of symbols:

Symbol	Description
	<p>The central rectangular symbol identifies the subject of the RS. It represents the scope boundary of the RS. There must be exactly one of these symbols in a Context Diagram.</p>
	<p>Ovals represent entities that are external to the scope of the RS, but with which the RS is either a consumer or producer of information. Each entity must be unambiguously named. A given named entity may appear more than once in the Context Diagram provided it has precisely the same name as its counterpart.</p> <p>Generally entities do not include Roles defined elsewhere in the RS as these are by definition in scope. However this is not an absolute rule. For example, a defined Role might download a data file for further processing outside of the RS scope. This data flow should be noted in the Context Diagram.</p>
	<p>The arrow symbols represent data flows, with cardinality determined by the direction of the arrow. The data flow must be named. The name may represent more than a single instance of a data flow (for example different correspondences) provided that the instances are clearly defined elsewhere, typically in an IER.</p>

6.1.6 Roles & Role Inheritance

- 6.1.6.1 A role is a label given to a set of capability and permissions that an Actor in a BUC may be granted. Roles can appear in both the AIBM and TBBM. The scope does not extend beyond the parent business model unless explicitly stated. Thus, for example, where a role is stated in the AIBM and is retained in the TBBM, the TBBM should make this clear and note any changes to the AIBM role.
- 6.1.6.2 It is important to understand that a role is a simple abstraction for the parent business model. It does not imply an equivalent job title in the organisation specifying the requirements. Translating these abstractions into real job titles/capabilities would be part of the business change plan that implements the TBBM.
- 6.1.6.3 Roles are usually shown in a table in the business model consisting of the role name, a brief description of the role and other relevant details. Typically a role will have a short, reasonably appropriate name relevant to the AIBM and TBBM. Abbreviations are acceptable and often used as a means of avoiding longwinded role names.
- 6.1.6.4 As a Primary Actor in a given user goal BUC, the role should provide all the capabilities and permissions needed complete all the Main Scenario business process steps and related rules in the BUC. This is relaxed for high level BUCs describing, for example, workflows.

- 6.1.6.5 As a Secondary Actor, the role should provide the capabilities and permissions needed complete the steps business process steps and rules ascribed to that role. Typically steps for secondary roles will appear in the Extension clauses in user goal BUCs.
- 6.1.6.6 A role “System” should not appear in the Role table. If it proves necessary to have a “System” Actor (note, not “The System”) then it has magical and unlimited capabilities and permissions. Which is one of the reasons why it shouldn’t appear.
- 6.1.6.7 Roles are commonly found to be hierarchical. To avoid duplication of role descriptions in a hierarchy, higher level roles can be said to inherit the characteristics and permissions of a lower level role. This is represented in the Requirement Specification by a Role Inheritance Diagram, for example:

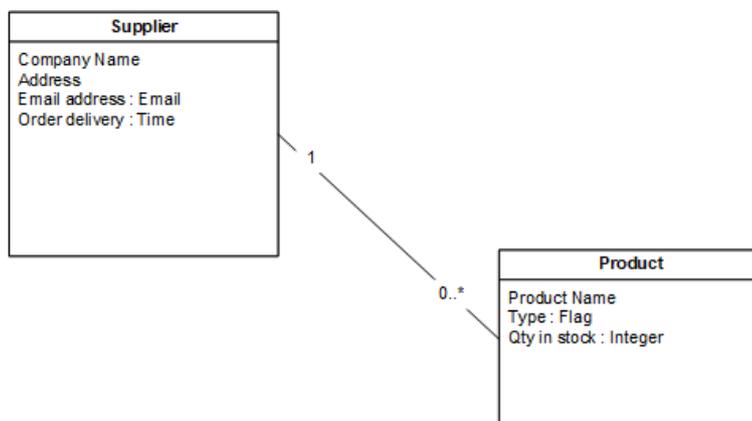


- 6.1.6.8 In the example, the Marketing User and Finance User roles inherit permissions and characteristics from the User role. However the Marketing Manager inherits only from Marketing User.
- 6.1.6.9 In the BUCs, an actor with the Marketing User role may follow any steps assigned to the User role, and the Marketing Manager can in turn follow any steps assigned to a Marketing User. However neither of these roles (or the User role) may follow steps assigned to the Finance User role.
- 6.1.6.10 Inheritance from more than one lower level role is OK but is discouraged. It can lead to some confusion and even circular inheritance in complex situations.

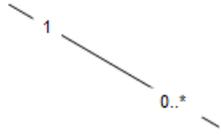
6.1.7 Domain Model

- 6.1.7.1 The Domain Model is a conceptual data model of the domain of data manipulated by the TBBM. It is conceptual in that it doesn’t represent an actual set of data, but instead indicates the general set of data which a solution design should take into account. It is intentionally simplified in order to give a good overview of the data set without becoming pedantic regarding purely technical structures. The intent is that it should be reasonably easy to grasp for a reviewer without needing specialist data modelling skills.

6.1.7.2 The diagram technique employed for the Domain Model in the TBBM is a version of the UML Class diagram. For example:



6.1.7.3 The symbols used for the Domain Model diagram are as follows:

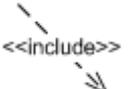
Symbol	Description
	<p>Entity. Each entity is a container having an entity name (in the upper rectangle) and a collection of data attributes (in the lower rectangle). Entity names and attribute names should be easily recognisable as their real world equivalents.</p> <p>Each attribute can optionally have a data type indicator, which is separated from the attribute name by a colon. Data types can be as simple as a number or a date, or more complex, for example a document or a list of items.</p>
	<p>Relationship. Entities can be linked by relationships. The entities are joined by a line which has a note of the nature of the relationship at each end. In the example diagram above, a Supplier may have zero or more (0..*) Products, whereas a Product must always have exactly one Supplier.</p>

6.1.7.4 The Domain Model may also be supported by a Data Dictionary. The Data Dictionary aims to provide more details regarding each data attribute. This is often presented as a spreadsheet annexed to the Requirement Specification document.

6.1.8 Business Use Cases

6.1.8.1 Business Use Case are usually organised into packages of related BUCs. These packages are summarised with a standard UML Use Case diagram. The BUC diagrams have five symbols. Note that the box enclosing the use case oval symbols is merely a diagramming motif and does not have any special significance.

Symbol	Description
 Actor	<p>Roles in BUCs are represented by Actor symbols in a BUC diagram, the Actor symbol being named for the corresponding role. BUCs that appear in a diagram will usually have at least one role (the primary) associated with it (see below). Secondary roles may also be indicated.</p>

Symbol	Description
	An oval symbol indicates the named BUC, full details of the BUC being provided by the similarly named textual section. A BUC symbol will normally be associated with at least one Actor and may have zero or more extensions and inclusions.
	Indicates the association of an Actor with a particular BUC. It may be labelled with the main action performed in the BUC by the Actor.
	An extension to a BUC is symbolised by the dashed arrow. The arrow points from the extension BUC to its parent. Extensions points will always be listed in the parent BUC, usually as an Alternative Path.
	BUCs that are included in other BUC use a similar dashed arrow as extensions. However the arrow points from the parent to the BUC that is to be included. The parent BUC will always note where inclusions appear in either the Main or Alternative Paths.

6.1.9 BUC Structure & Content

- 6.1.9.1 Each BUC describes a specific scenario of goal-driven actions for a primary Actor. This is termed the Main Path. The Main Path begins with a trigger and ends with attainment of the goal. Alternative Paths provide process variations of significance from the Main Path which may result in attainment of other related goals. Business Rules in each BUC describe features of the business process that support or constrain the achievement of the goal.
- 6.1.9.2 BUCs usually aim to be solution agnostic. They try to describe the processing that must be done and rules that apply without reference to a particular technology. This widens the possible set of solutions and thus improves the chances of finding an optimal solution. However in the real world there are often technical or architectural constraints with which the BUCs must be consistent.
- 6.1.9.3 BUCs are intentionally high level and do not, for example, normally describe details of error conditions and user interface features. The need to express a “System” role processing step generally means too much detail. A BUC describes business processes and rules, not the implementation functionality that will support it. That said, and given IT is often ubiquitous to business processes in the world of today, it is some necessary to mention “System”.
- 6.1.9.4 BUCs should contain more or less grammatical sentences, but are intentionally written in a terse and precise style. Lots of words can easily lead to confusion about the exact meaning of those words.

6.1.10 BUC Clauses

6.1.10.1 The following section explains the purpose and meaning of each clause of a BUC.

Clause	Description
Level	High Level or User Goal. All BUCs should be fairly high level and not describe fine details of activities. Most BUCs should be User Goal. High Level BUCs tend to be things like descriptions of the main steps in a workflow.
Title	Of the form: "BUC99 Title". The BUC number is purely to provide a unique identifier. BUC numbers do not imply a relationship with other BUCs nor a processing sequence.
Description	The description is usually an opportunity to put the BUC in a business context. It should be concise and should not repeat information found elsewhere in the BUC. It is perfectly acceptable that no description clause is included. It is important that the description does not contain any statements that could be considered a requirement. Requirement statements should be placed in one of the other clauses of the BUC.
Extends Included in	This clause(s) indicates child relationships with other BUCs to aid traceability. Both extend and include imply that the BUC isn't executed in isolation but in the context of the parent BUC noted in this clause. The difference between extend and include is somewhat theological. Non-specialists reviewers can usually ignore this subtlety.
Extended by Includes	Denotes the corresponding parent relationship as above. Adding Extended/Included BUCs is a technique often used to: <ul style="list-style-type: none"> • break up a large or complex BUC into smaller, more digestible parts; or • avoid repeating similar chunks of business processes also found elsewhere in other BUCs.
Actors	Actors are the participants in the BUC. They are denoted by their role as found in the Roles section of an As-Is or To-Be business model. The first Actor is termed the Primary Actor. On normal completion of the BUC, the Primary Actor should accrue the benefits of the Success Criteria below. Secondary Actors may also be present. They participate at specific points in the BUC and do not necessarily gain the benefits of the Success Criteria.
Success Criteria	Arguably the most important element of a BUC as it defines its purpose. This clause should answer the question "What does success look like?". The focus of the BUC is in achieving this goal. This should be stated in business terms. It should not merely be a repetition of the Post Conditions.

Clause	Description
Pre-conditions	<p>This clause sets the BUC in context. It lays out the circumstances (in business terms) which must be present for the execution of a BUC to begin.</p> <p>In practise to avoid tiresome repetition, pre-conditions that are widely applicable are usually placed in a “General BUC Rules” section of documents presenting BUCs.</p> <p>Well stated pre-conditions are important for accurate testing of a BUC, for example during a UAT.</p>
Trigger	<p>This clause states the event that causes the BUC to start. This is not the same as the pre-conditions which set the context for the trigger to occur.</p> <p>There must be at least one trigger event, and one event only is the norm. More than one trigger is acceptable, but multiple triggers often implies the underlying business processes aren’t well understood.</p>
Main Path	<p>These are the process steps that are the road to the Success Criteria. They must be followed, usually by the Primary Actor, in the sequence defined within this clause unless clearly stated otherwise.</p> <p>There must be at least one Main Path step in a BUC. More than 8 steps is rare, and a single step is not uncommon.</p> <p>Each step should begin by denoting an Actor and describes an action taken by the Actor.</p> <p>By convention references to other BUCs that are included in a step are underlined.</p>
Post Conditions	<p>The end of the journey to the Success Criteria. There must be at least one Post Condition, and possibly several. However more than two tends to suggest that the BUC is trying to do too many things and may be a candidate for breaking up.</p> <p>Much as for Pre-conditions, accurate Post Conditions are important in testing.</p>

Clause	Description
Alternative Paths	<p>Alt Paths represent alternative sequences of actions than those found in the Main Path under specific circumstance. In effect they substitute for the corresponding Main Path step.</p> <p>The numbering of Alt Paths matches them to their corresponding Main Path step. For example:</p> <ul style="list-style-type: none"> • Alt Path 1a is the first related to Main Path step 1. • Alt Path 2a is the first related to Main Path step 2. • Alt Path 2b is the second related to Main Path step 2. • Alt Path 4e is the fifth related to Main Path step 4. <p>Alt Paths start by stating their trigger (<u>underlined</u>) and then have one or more action steps. The step numbers are prefixed with their parent Alt Path number. Thus:</p> <ul style="list-style-type: none"> • Alt Path step 2a1 is the first step of Alt Path 2a. • Alt Path step 4e3 is the third step of Alt Path 4e. <p>Other than sequence numbering, Alt Path actions are the same as those for Main Path. They begin by identifying the Actor in question and follow with an action statement.</p> <p>Alt Paths may be nested to one level. Thus:</p> <ul style="list-style-type: none"> • Alt Path 1a1a is the first related to Alt Path step 1a1. • Alt Path 4e3c is the third related to Alt Path step 4e3. <p>There is no limit to the number of Alt Paths, though if the BUC exhausts the alphabet it can be assumed that it is trying to do too much!</p> <p>By convention when an Alt Path ends then the next step resumes in the Main Path immediately after parent step. The Alt Path may also explicitly state the next step, or terminate the BUC with an explicit "Post" Post-condition.</p>
Business Rules	<p>Much of a BUC is focused on process steps. This clause doesn't. Other than the unique numbering sequence prefixed by an "R", the content of this clause is very much determined by the nature of the BUC. There is no limit to the number of business rules. Having no rules associated with a BUC is unusual but not wrong. It is important to avoid extraneous waffle and be concise and accurate.</p> <p>As a guideline, business rules provide the opportunity to, for example:</p> <ul style="list-style-type: none"> • define constraints; • express more detail about the data processed; • reference external documentation; • etc.

6.2 Information Exchange Requirement

6.2.1 The Information Exchange Requirement given in the table below supports the Context Diagram (§2.3) The columns of the IER have the following meanings:

- (i) **ID** A unique Identifier for each dataflow. The whole numbers (eg 02) are as found in the Context Diagram of the NMF Requirement Specification. In some cases, these are broken down into multiple similar content (eg 02.01 and 02.02).
- (ii) **Information** A brief description of the dataflow content.
- (iii) **I/O** Whether the dataflow is inbound to, or outbound from, NMF.
- (iv) **From** The external entity name (or NMF Role name) sending the information.
- (v) **To** The external entity name (or NMF Role name) receiving the information.
- (vi) **Send** The BUC that is responsible for initiating to an outbound dataflow.
- (vii) **Receive** The BUC that is responsible for consuming an inbound dataflow.
- (viii) **Data Summary** A summary of the main data items contained in the dataflow. Where these are related to data entities from the Domain Model (§2.6), the name of the data entity is enclosed in square brackets, for example [Energy Resource]. Depending on the business purpose of the dataflow, only a subset of attributes of the Domain Model entity may be include.

ID	Information	I/O	From	To	Send	Receive	Data Summary
01	Registration Request	In	Registration Requestor	Registrar		BUC05	Registration documentation
02	Request Outcome						
02.01	Registration Successful	Out	Registrar	Registration Requestor	BUC05		[Industry Actor], [User]
02.02	Registration Rejected	Out	Registrar	Registration Requestor	BUC05		Reason for rejection
03	Industry Actor Correspondence						
03.01	Request NMF User account	In	Industry Actor	Admin		BUC02	[User]
03.02	NMF User account create	Out	Admin	Industry Actor	BUC02		[User]
03.03	Request NMF account amendments	In	Industry Actor	Admin		BUC03	[Industry Actor], [User]
03.04	NMF User account amend	Out	Admin	Industry Actor	BUC03		[Industry Actor], [User]
03.05	Industry Actor correspondence	Out	User	Industry Actor	BUC07		[Industry Actor], [User]
03.06	Register an Energy Resource	In	Industry Actor	Registrar		BUC50	Energy resource documentation
03.07	NMF Energy Resource registration completed	Out	Registrar	Industry Actor	BUC50		[Energy Resource]
03.08	NMF Energy Resource registration fails	Out	Registrar	Industry Actor	BUC50		[Industry Actor], Reason for rejection
03.09	NMF Energy Resource amendment request	In	Industry Actor	Admin		BUC51	[Energy Resource]

ID	Information	I/O	From	To	Send	Receive	Data Summary
03.10	NMF Energy Resource amendment fails	Out	Admin	Industry Actor	BUC51		[Industry Actor], Reason for rejection
03.11	NMF Energy Resource amendment completed	Out	Admin	Industry Actor	BUC51		[Energy Resource]
03.12	NMF Energy Resource correspondence	Out	Bid Officer	Industry Actor	BUC53		[Industry Actor], [User], [Energy Resource]
03.13	Request to publish NMF Request	Out	Request Manager	Request Authoriser	BUC12		[User], [Request]
03.14	Request to withdraw NMF Request	Out	Request Manager	Request Authoriser	BUC12		[User], [Request]
03.15	NMF Request published	Out	Request Authoriser	Industry Actor	BUC13		[Industry Actor], [Request]
03.16	NMF Request withdrawn	Out	Request Authoriser	Industry Actor	BUC13		[Industry Actor], [Request]
03.17	NMF Request selection approval request	Out	Request Manager	Request Authoriser	BUC14		[User], [Request], [Offer]
03.18	NMF Request selection approval granted	Out	Request Authoriser	Request Manager	BUC14		[User], [Request], [Offer]
03.19	NMF Request selection approval withheld	Out	Request Authoriser	Request Manager	BUC14		[User], Reason for rejection
03.20	NMF Request auction outcome	Out	Request Authoriser	Industry Actor	BUC14		[Industry Actor], [Request], [Offer]
03.21	NMF Request published	Out	System	Industry Actor	BUC16		[Industry Actor], [Request]
03.22	Standing Offer Made	Out	System	Offer Manager	BUC17		[Industry Actor], [Request], [Offer]
03.23	NMF Offer made	Out	System	Industry Actor	BUC17		[Industry Actor], [Request], [Offer]
03.24	Request to publish NMF Offer	Out	Offer Manager	Offer Authoriser	BUC54		[User], [Offer]
03.25	Request to withdraw NMF Offer	Out	Offer Manager	Offer Authoriser	BUC54		[User], [Offer]
03.26	NMF Offer published	Out	Offer Authoriser	Industry Actor	BUC55		[Industry Actor], [User], [Offer]
03.27	NMF Offer withdrawn	Out	Offer Authoriser	Industry Actor	BUC55		[Industry Actor], [User], [Offer]
03.28	NMF Offer correspondence	Out	Officer	Industry Actor	BUC56		[Industry Actor], [User], [Offer]
03.29	Request to publish NMF Bid	Out	Bid Manager	Bid Authoriser	BUC21		[User], [Offer], [Bid]
03.30	Request to withdraw NMF Bid	Out	Bid Manager	Bid Authoriser	BUC21		[User], [Offer], [Bid]
03.31	NMF Bid published	Out	Bid Authoriser	Industry Actor	BUC22		[Industry Actor], [Offer], [Bid]
03.32	NMF Bid withdrawn	Out	Bid Authoriser	Industry Actor	BUC22		[Industry Actor], [Offer], [Bid]
03.33	NMF Offer selection approval request	Out	Offer Manager	Offer Authoriser	BUC23		[User], [Offer], [Bid]
03.34	NMF Offer selection approval granted	Out	Offer Authoriser	Offer Manager	BUC23		[User], [Offer], [Bid]
03.35	NMF Offer selection approval withheld	Out	Offer Authoriser	Offer Manager	BUC23		[User], Reason for rejection
03.36	NMF Offer auction outcome	Out	Offer Authoriser	Industry Actor	BUC23		[Industry Actor], [Offer], [Bid]
03.37	Intent to Dispatch notice	In	Dispatch Instructor	Dispatch Manager		BUC31	[Energy Resource], [Dispatch]
03.38	Proof of Dispatch	Out	Dispatch Manager	Industry Actor	BUC30		[Energy Resource], [Dispatch]

ID	Information	I/O	From	To	Send	Receive	Data Summary
03.39	Bi-lateral Contract approval request	Out	Offer Manager	Offer Authoriser	BUC71		[Private Contract], [Energy Resource]
03.40	ESO/DSO fiat instruction	Out	Network Manager	Dispatch Manager	BUC34		[Energy Resource], [Dispatch]
04	Auto Request						
04.01	Auto request received	In	DSO::WSC	System		BUC16	[Request]
04.02	Auto request successful	Out	System	DSO::WSC	BUC16		[Request], Acknowledgement
05	Intent to Dispatch details	Out	System	DSO::WSC	BUC31		[Energy Resource], [Dispatch]
06	Constraint Estimate						
06.01	Constraint estimate request	In	DSO::WSC	System	BUC58		[Request]
06.02	Constraint estimate proposal	Out	System	DSO::WSC		BUC58	[Offer], Acknowledgement
07	Proof of Dispatch details	Out	System	DSO::WSC	BUC30		[Energy Resource], [Dispatch]
08	Export of list and/or report data	Out	User	User	3.2.1f		PDF or Excel format files

6.3 Domain Model Data Dictionary

6.3.1 The Data Dictionary given in the table below supports the Domain Model (§2.6) by providing additional information about the attributes in each entity. Data Type are:

- (i) **Text**, alphanumeric characters
- (ii) **Money**, GB Pounds (£0.00)
- (iii) **Date**, standard UK date (eg, "dd mmm yy")
- (iv) **Date / Time**, standard UK date and time (eg, "dd mmm yy hh:mm")
- (v) **Document**, one or more MS Office compatible document(s)
- (vi) **Switch**, a boolean value (eg, Y/N)
- (vii) **Flag**, one value from a defined list (eg "Red", "Amber", "Green")
- (viii) **Blog**, textual commentary, eg identifying a user, the time of a posting and free text comment
- (ix) **List**, one or more values from a defined list
- (x) **Time**, a contiguous duration (eg, days:hours:mins:secs)
- (xi) **Percent**, a percentage value
- (xii) **Number**, a simple numerical value
- (xiii) **kW**, kilowatts
- (xiv) **kVA**, kilo volt amps
- (xv) **kWh**, kilowatt hour
- (xvi) **Calendar**, a collection of date/times
- (xvii) **kVA_r**, kilo volt amps of resistive power
- (xviii) **kVA_rh**, kilo volt amps of resistive power hours
- (xix) **MPAN**, a Meter Point Administrative Number

Entity	Attribute	Data Type	Description	Values
Industry Actor	Type	Flag	Type of IA	DSO, ESO, Aggregator, Trader, etc.
Industry Actor	Name	Text	Name of the IA	
Industry Actor	Email address	Email	Main email address for the IA for NMF business. Messages from NMF to the IA as listed in the IER will by default be sent to this address. IA should consider local re-direction by their email server to appropriate message queues.	

Entity	Attribute	Data Type	Description	Values
Industry Actor	Registration	Document	Registration document(s) presented by IA to the NMF Registrar during NMF company registration.	See BUC05.
Industry Actor	Auto request	Switch	IA is entitled to send automated NMF Requests to NMF.	See BUC16.
Industry Actor	Suspended	Switch	Set when the IA's access rights to NMF have been suspended.	See BUC03.
Industry Actor	Reliability	Percent	Rating of past reliability in completion of dispatches.	
Industry Actor	BRP	Switch	Balance Responsible Party	
Industry Actor	WSC	Switch	Whether or not a DSO has a Whole System Coordinator system.	
User	Name	String	Name of an individual within the IA.	
User	Email address	Email	Email address specifically for the IA individual.	May be null. However an IA must have at least one User with an email address for security consultation purposes. See BUC05.
User	Password	Text	A password as defined by NMF security requirements.	Or other security credential as defined by SSEN.
User	Password expiry	Date	Date at which the security credential will expire.	As above.
User	Roles	List	The list of the NMF Roles which the IA individual has been assigned.	
User	Registration	Document	Registration document(s) presented by IA to the NMF Registrar during user registration.	
User	Suspended	Switch	Set when the individual's access rights to NMF have been suspended.	See BUC03.
Energy Resource	Status	Switch	Current status of an energy resource.	Active, Retired
Energy Resource	Created	Date	The date on which the energy resource is added to the IA holding.	See BUC51.
Energy Resource	Retired	Date	The date on which the energy resource is removed from the IA holding.	See BUC51.
Energy Resource	Name	Text	The name of the energy resource.	

Entity	Attribute	Data Type	Description	Values
Energy Resource	Published	Switch	Whether or not the energy resource is visible to other IA.	See BUC52.
Energy Resource	Total power max	kVA	Maximum total power supplied/removed by the energy resource.	
Energy Resource	Total power min	kVA	Minimum total power that can be supplied/removed by the energy resource.	
Energy Resource	Total power variance	Percent	Maximum expected variance in the total power uniform capacity of the energy resource.	
Energy Resource	Active power max	KW	Maximum active supplied/removed by the energy resource.	
Energy Resource	Active power min	KW	Minimum active power that can be supplied/removed by the energy resource.	
Energy Resource	Active power variance	Percent	Maximum expected variance in the active power uniform capacity of the energy resource.	
Energy Resource	Reactive power max	kVAr	Maximum reactive power supplied/removed by the energy resource.	
Energy Resource	Reactive power min	kVAr	Minimum reactive power that can be supplied/removed by the energy resource.	
Energy Resource	Reactive power variance	Percent	Maximum expected variance in the reactive power uniform capacity of the energy resource.	
Energy Resource	Minimum notice period	Time	The amount time needed to prepare the energy resource for a dispatch.	
Energy Resource	Arming time	Time	The time within the Notice Period in which the energy resource becomes committed to dispatch prior to ramping up. For example the time needed to gather together appropriate engineering staff prior to power on.	
Energy Resource	Ramp up time	Time	The time within the Notice Period in which the energy resource is "warming up".	

Entity	Attribute	Data Type	Description	Values
Energy Resource	Maximum service time	Time	The maximum length of time that the energy resource can provide its capacity.	
Energy Resource	Ramp down time	Time	The time needed for the energy resource to "warming down" following a dispatch.	
Energy Resource	Options	Flag	Dispatch options available for the energy resource.	Standard system options and resource specific options should be possible.
Energy Resource	MPAN	MPAN	The MPAN of the energy resource.	
Location	Region	Flag	One of the regional electricity distribution networks.	Each of the 14 licenced distribution networks.
Location	Parent	Flag	The parent location for a given location. Used to create a hierarchical location structure.	Top level parent locations in the network would be the GSPs.
Location	Location	Flag	Abstract identifier of a specific segment of the DSO electricity network. Enables NMF Request / NMF Offer matching and calculation of cumulative impact of dispatches at location levels above that of a given dispatch.	
Location	Postal district	Flag	The postal district(s) in which the location exists.	For bottom level locations only.
Market Category	Type	Text	A characteristic of an energy resource and related NMF Requests and NMF Offers.	Voltage Level, Energy Effect, Power Source, Min Notice, Low Carbon, Standby Request etc.
Market Category	Label	Text	An appropriate value for the category.	Eg. Voltage Level: 33kV, 11kV, LV... Energy Effect: Supply, Demand Reduction Power Source: Gas, Coal, Nuclear, Wind... Min Notice: Short, Medium, Long Standby Request: Y/N
Request	Title	Text	A title for the request.	
Request	Description	Text	A short description of the request.	Optional
Request	Contract	Document	One or more documents covering contractual matters for the request.	If necessary only. Should be covered by NMF participation rules.
Request	Status	Flag	The current status of the request.	Draft, Published, Offers Selected, Closed

Entity	Attribute	Data Type	Description	Values
Request	Request published	Date/Time	Date at which the request was published to NMF.	See BUC13.
Request	Auction period	Time	Period from the published date/time to the end of the request auction.	
Request	Outcome	Flag	The outcome of the request auction.	No Offers, Selections Made, No Successful Offer, Withdrawn
Request	Comments	Blog	For discussion regarding the request between owning IA users only.	
Request	Threshold dispatch fee	Money	Maximum amount that the requestor is willing to pay for the dispatch.	Not definitive. May choose to pay more/less depending on offer characteristics. Per kWh or forecast kWh.
Request	Threshold standby fee	Money	Maximum amount that the requestor is willing pay for standby.	Not definitive. May choose to pay more/less depending on offer characteristics. Fixed fee.
Request	Request period start	Date	Start of the period of need for flexible power.	Null if a single dispatch
Request	Request period end	Date	End of the period of need for flexible power.	Null if a single dispatch
Request	Dispatch start	Date/Time	Intended start date/time for a single dispatch.	Time only if a repetition cycle is requested.
Request	Duration	Time	The length of contiguous time for the dispatch.	
Request	Repetition	Calendar	Recurrence cycle of request, thus a set of start dates.	Optional.
Request	Uniform capacity	kW / kVAr	Amount of electricity to be continuously dispatched.	
Request	Tolerance	Percent	Acceptable variance from the uniform capacity at any time during the dispatch.	
Request	Exclusive	Switch	Whether or not the request is for exclusive access to NMF Energy Resources.	Y/N
Request	Notice period	Time	The notice period that will be given for the dispatch by the requestor.	
Request	Arming time	Time	Maximum acceptable arming period.	
Request	Ramp up time	Time	Maximum acceptable ramp up period.	
Request	Ramp down time	Time	Maximum acceptable ramp down period.	

Entity	Attribute	Data Type	Description	Values
Request	Auto-created	Switch	Whether or not the request was generated by an external system.	Y/N. See BUC16.
Bid	Status	Flag	Current status of the bid.	Draft, Published, Successful, Closed
Bid	Standby fee	Money	Fee the bidder is willing to pay for standby time.	Fixed fee
Bid	Arming fee	Money	Fee the bidder is willing to pay for arming time.	per kWh / kVArh
Bid	Dispatch fee	Money	Fee the bidder is willing to pay for a dispatch.	per kWh / kVArh
Bid	Unwinding fee	Money	Fee the bidder is willing to pay for an unwinding event.	Fixed fee
Bid	Comments	Blog	For discussion regarding the bid between owning IA users only.	
Offer	Status	Flag	Current status of the offer.	
Offer	Dispatch fee	Money	Payment the seller is willing to accept for a dispatch.	per kWh / kVArh
Offer	Arming fee	Money	Payment the seller is willing to accept for arming time.	Fixed fee
Offer	Standby fee	Money	Payment the seller is willing to accept for standby time.	Fixed fee
Offer	Unwinding fee	Money	Payment the seller is willing to accept for unwinding a dispatch following the start of the arming period.	Fixed fee
Offer	Offer period start	Date	Date from which the offer of standby power starts	Null if a single dispatch
Offer	Offer period end	Date	Date at which the offer of standby power ends	Null if a single dispatch
Offer	Dispatch start	Date/Time	Intended start date/time for single dispatch.	Time only if a repetition cycle is requested.
Offer	Duration	Time	The length of contiguous time for the dispatch.	
Offer	Repetition	Calendar	Recurrence cycle of request, thus a set of start dates.	Optional.
Offer	Uniform capacity	kW / kVAR	Continuous electricity capacity provided throughout the offer period.	
Offer	Variability	Percent	The maximum variance in the uniform capacity of the offer.	

Entity	Attribute	Data Type	Description	Values
Offer	Notice period	Time	The notice period required for the Offer. A NMF Dispatch Instruction must be received at a date/time prior to the start date/time of the dispatch minus the notice period.	
Offer	Standing	Switch	Whether or not this is a standing offer.	Y/N. See BUC17.
Offer	Comments	Blog	For discussion regarding the offer between owning IA users only.	
Offer	Contract	Document	One or more documents covering contractual matters for the offer.	If necessary only. Should be covered by NMF participation rules.
Dispatch	Status	Flag		Selected, Draft, Dispatch, Completed
Dispatch	Dispatch start	Date/Time	Date and time of the start of the dispatch.	
Dispatch	Duration	Time	Actually contiguous time of the dispatch.	Hours
Dispatch	Dispatch capacity	kW / kVAr	Average power for the dispatch	
Dispatch	Variability	Percent	Maximum variance from target dispatch power	
Dispatch	Dispatch history	List	A list of NMF events related to the NMF Dispatch	Intent to Dispatch, Proof of Dispatch, No dispatch required, Percentage utilised
Dispatch	No dispatch	Switch	No dispatch is required.	Y/N
Dispatch	No dispatch reason	Flag	The reason the dispatch has been cancelled.	
Dispatch	Energy resources	List	The NMF Energy Resources to be dispatched. A subset of the NMF Energy Resources in the NMF Offer or NMF Bi-lateral Contract.	
Intent to Dispatch	Notification	Date/Time	When the Intent to Dispatch was issued.	
Intent to Dispatch	Intended start	Date/Time	Date and time of the intended start of the dispatch.	
Intent to Dispatch	Intended duration	Time	Intended contiguous time of the dispatch.	
Intent to Dispatch	Intended capacity	kW / kVAr	Intended average power for the dispatch	
Intent to Dispatch	Intended variability	Percent	Intended maximum variance from target dispatch power	
Intent to Dispatch	Notes	Document	Any notes or other information needed by the Dispatch Manager to facilitate the dispatch.	Optional

Entity	Attribute	Data Type	Description	Values
Intent to Dispatch	Energy resources	List	The NMF Energy Resources to be dispatched. A subset of the NMF Energy Resources in the NMF Offer or NMF Bi-lateral Contract.	
Proof of Dispatch	Notification	Date/Time	When the Proof of Dispatch was issued.	
Proof of Dispatch	Actual start	Date/Time	Date and time of the actual start of the dispatch.	
Proof of Dispatch	Actual duration	Time	Actual contiguous time of the dispatch.	
Proof of Dispatch	Actual capacity	kW / kVAR	Actual average power for the dispatch	
Proof of Dispatch	Maximum variance	Percent	Actual maximum variance from target dispatch power.	
Proof of Dispatch	Standby fee	Switch	Standby payment due.	
Proof of Dispatch	Arming fee	Switch	Arming payment due.	
Proof of Dispatch	Unwinding fee	Switch	Unwinding fee due.	
Proof of Dispatch	Proof of Dispatch	Document	Documentary evidence of the dispatch.	
Bi-lateral Contract	Title	Text	Title of the private contract.	
Bi-lateral Contract	Description	Text	Brief description of the private contract.	Optional? Useful for DSO to understand background of the private contract.
Bi-lateral Contract	Status	Flag	Current status of the private contract.	Active, Completed. See BUC71.
Bi-lateral Contract	Dispatch start	Date/Time	Intended start date/time for the dispatch.	Time only if a repetition cycle is requested.
Bi-lateral Contract	Duration	Time	The length of contiguous time for the dispatch.	
Bi-lateral Contract	Repetition	Calendar	Recurrence cycle of request, thus a set of start dates.	Optional.
Bi-lateral Contract	Uniform capacity	kW / kVAR	Continuous electricity capacity provided throughout the contract period.	
Bi-lateral Contract	Variability	Percent	The maximum variance in the uniform capacity for the contract.	
Bi-lateral Contract	Exclusive	Switch	Whether or not the contract gives exclusive access to the related Energy Resources	Y/N

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