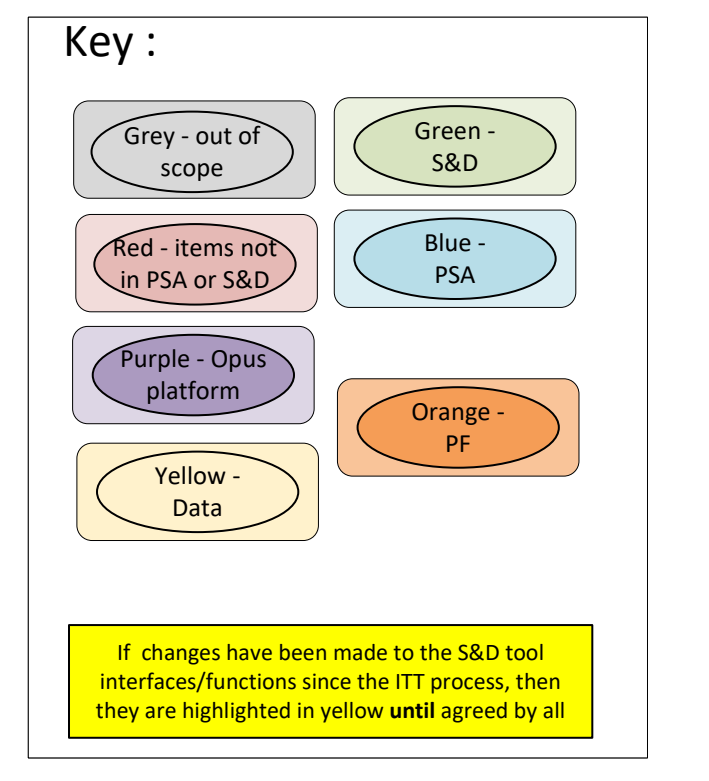
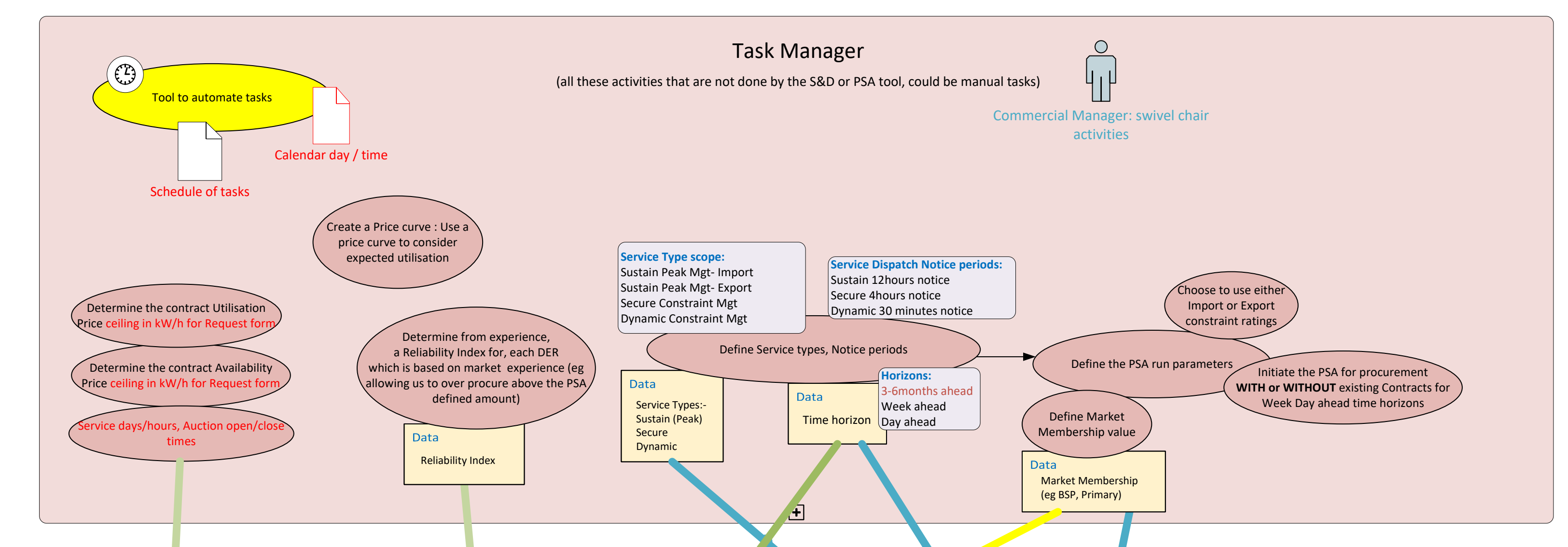


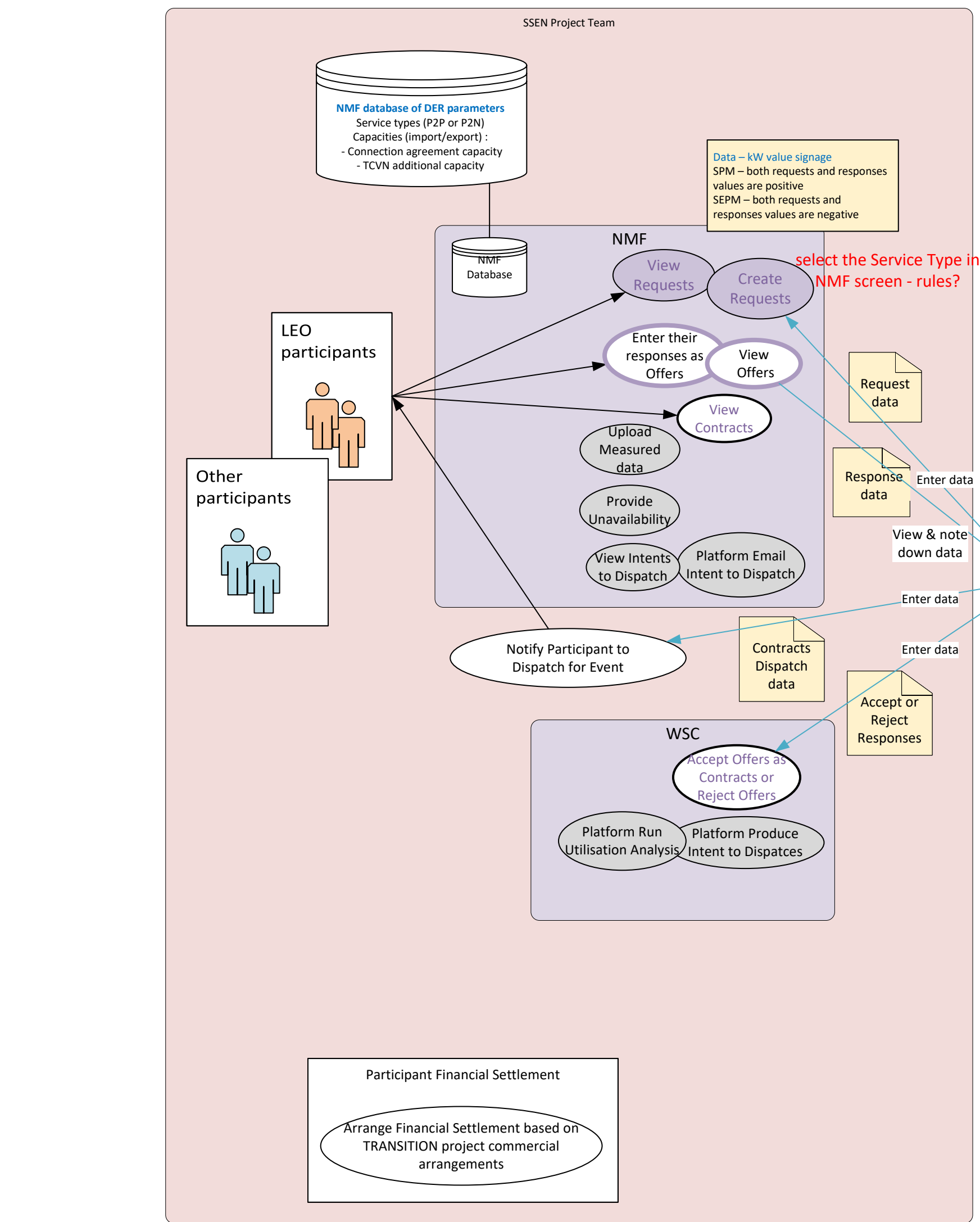
Scottish & Southern Electricity Networks
 SSN Context Diagram Scope PSA tool
 Author: Euan Hickey SSN
 Version: 4.0
 Date Issued: V1.0 31 May 2022 to Proj Mgr as defined not set
 V1.1 5 July 2022 to TNEI as to support project kick off migs
 V1.2 19/08/2022 - issued to TNEI and team
 V1.3 16/09/2022 - issued to TNEI and team
 V1.4 16/09/2022 - issued to TNEI and team
 Classification: Public



Context Diagram to identify the What and Why - not How and When



Example Request from parameters as defined in NMF:
 Date Request open/close, or predefined 24/48/72 hours
 PSA or S&S
 Service start/end date
 Service start/end time
 Service price - Utilization Price Ceiling, 400kWh
 Quantity of the bid
 Number of Service Hours



Scope: Single responses - resulting a single constraints
Dispatch analysis frequency: Hourly

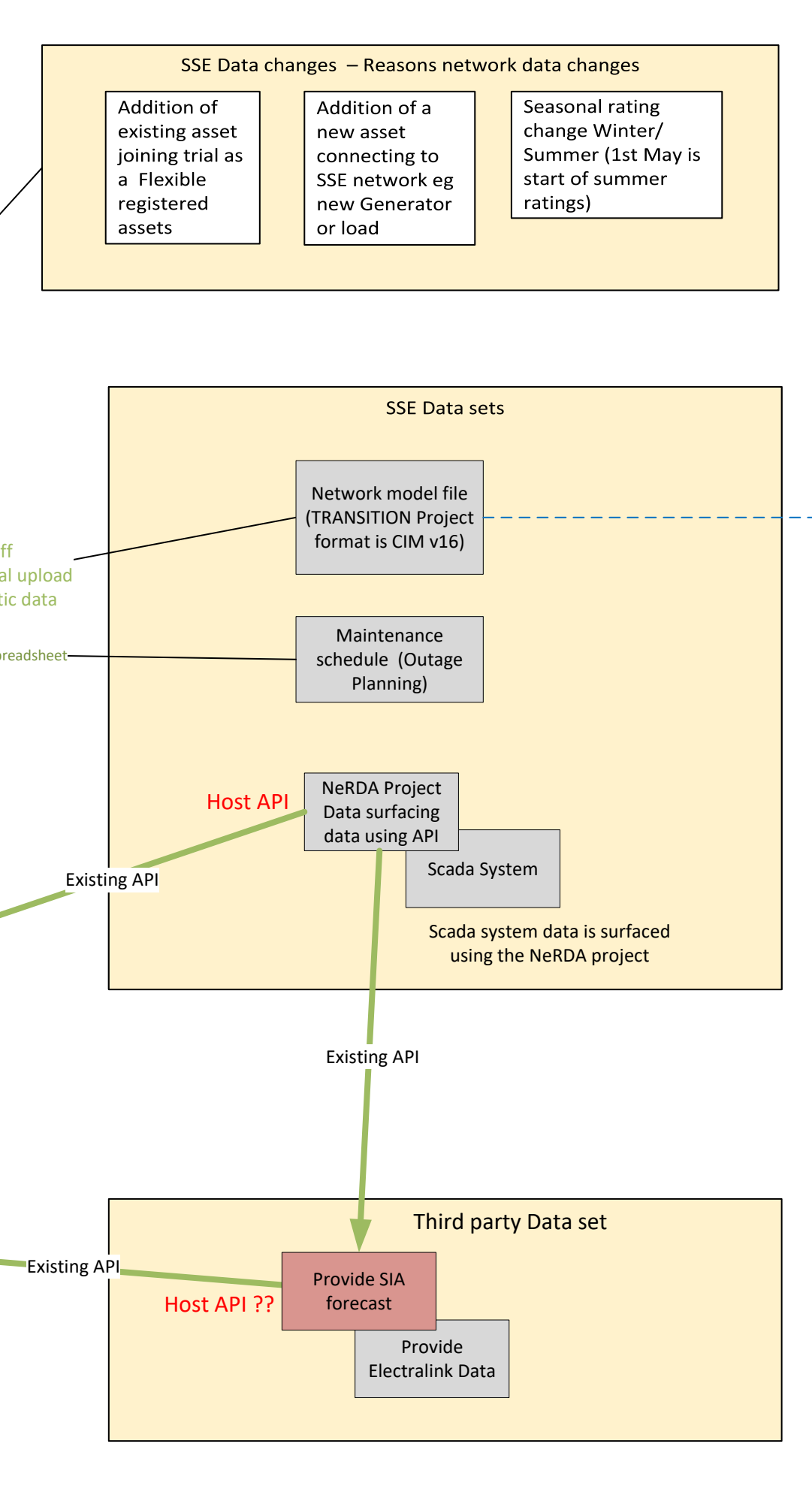
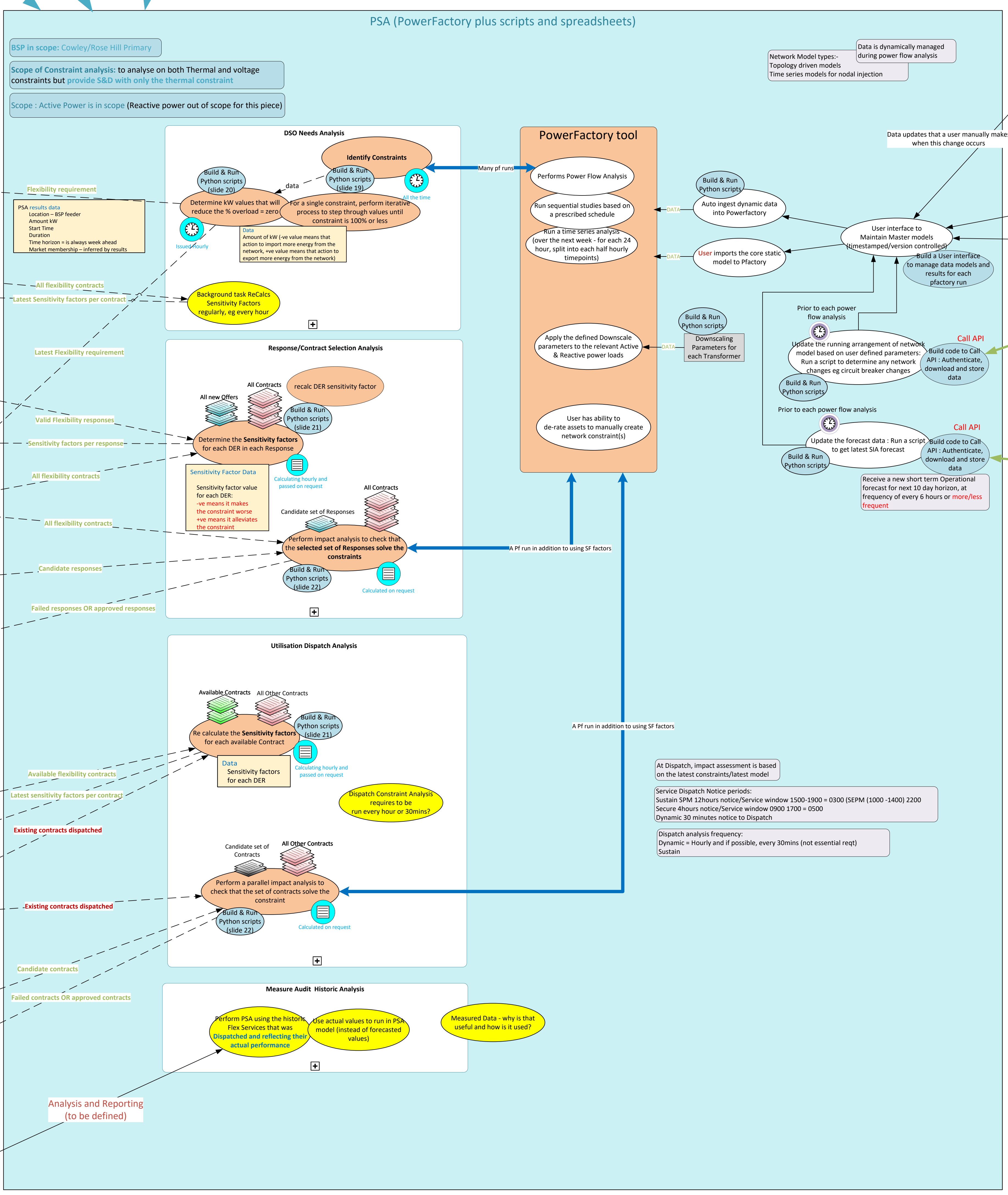
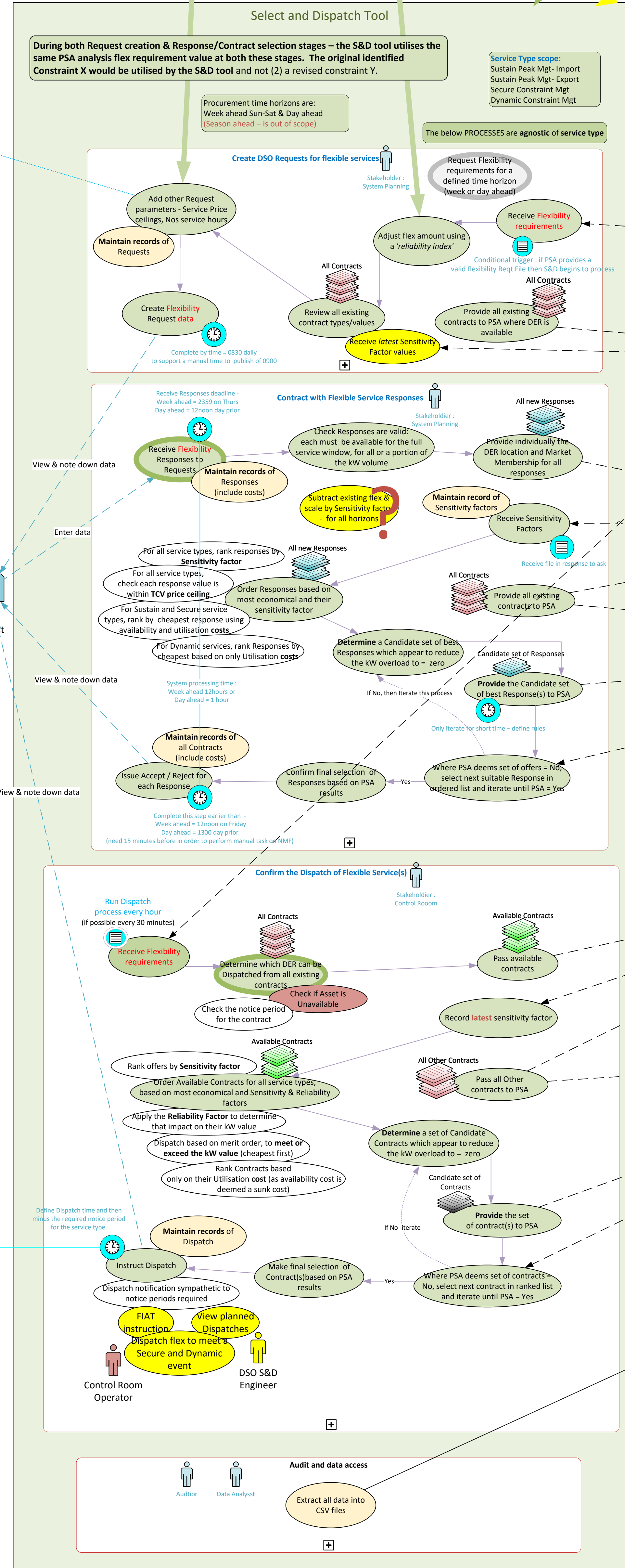
Task Manager - Technical Trials parameters -

Service type	Auction Service Window	Notice	Time that the Dispatch instruction is to be sent
Sustain Peak	0300 to 0600 - 1000 to 1400	15 minutes	Time averaged times (times average dispatch time - start of service window)
Sustain Export	0300 to 0600 - 1000 to 1400	15 minutes	(dispatch start time minus notice period required)
Secure	0000 to 2400	4 hours	1400 or 2200
Dynamic	0000 to 2400	30 minutes	Start 1200 (day prior) followed by every 4 hours Every hour onwards (or every 30mins if possible)

Auction Timetable for different Service Types:

BSF constraints:
 Sustain Peak & Sustain Export Peak Mkt Auction requests are issued on a Thursday for service window that is a week ahead of next week, Mon-Sun
 Secure Auction requests are issued on a Wednesday for the service window that is a week ahead of next week, Mon-Sun
 Dynamic Auctions are issued daily in the morning, for day ahead

Primary constraints:
 Primary auctions are to be issued (0k)

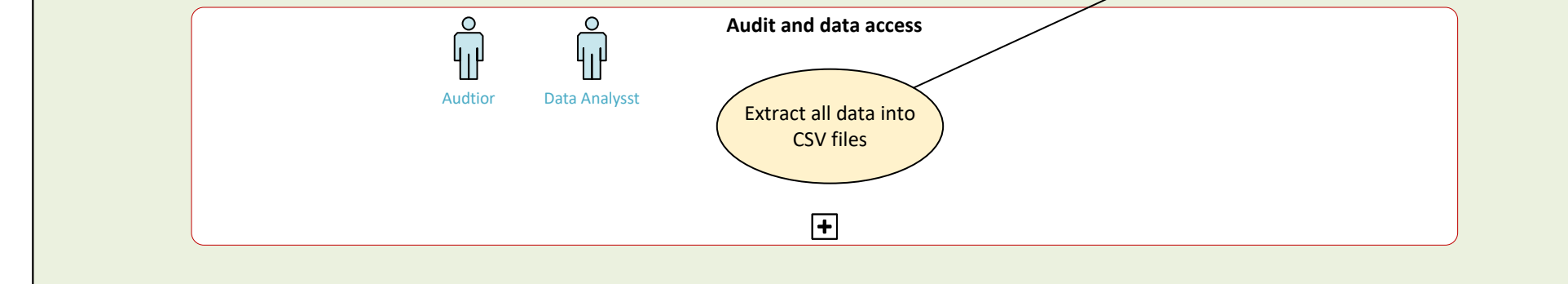


In order to build a network model suitable for power flow studies, which can be used to submit and dispatch flexibility requirements, the following data is required:

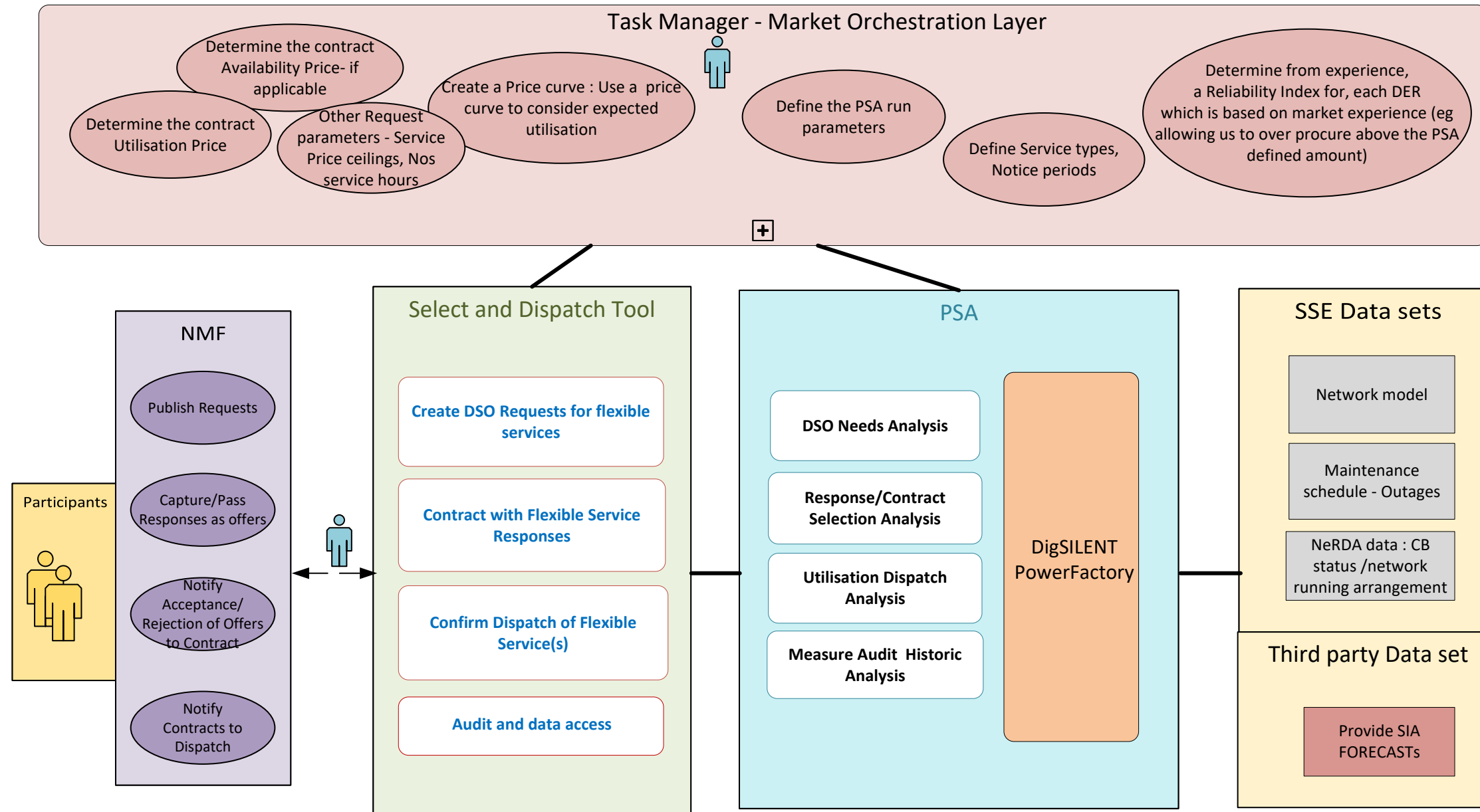
Network connectivity and running arrangement (i.e. how the network components connect to each other and status of circuit breakers)

- Asset network connectivity (topology) - This changes with time and PSA needs to keep a record of
- Running arrangement (i.e. status of circuit breakers due to outages/maintenance) - This changes with time and PSA needs to keep a record of
- Customer connectivity (i.e. where the customer are connected in the network) - This changes with time and PSA needs to keep a record of Transformer parameters (e.g. impedance, vector group)
 - Impedance and vector group
 - Tap changers (e.g. regulated busbar, target voltage, ratio, number of steps) - The target voltage changes with time (seasonal) and PSA needs to keep a record of
 - Length and line impedance
 - Length and line impedance
 - Settings (e.g. seasonal and emergency ratings) - This changes with time (seasonal) and PSA needs to keep a record of Smart capacitors parameters (e.g. rating, steps, target voltage)
- Forecasted demand (i.e. power required by customers connected to the network) - This changes with time and PSA needs to keep a record of the Operational Forecasting tool
 - For the Primary, out of scope of TRANSITION, demand data aggregated at the Primary level will be used
 - For the Secondary, out of scope of TRANSITION, demand data aggregated at the Secondary level will be used
 - For generators connected on 33kV and above, data from SSN's SCADA systems will be used
 - For generators connected on 11kV, market settlement data will be used
 - For other generators connected on 11kV, market settlement data will be used
 - For other generators connected on 11kV, market settlement data will be used
 - For other generators connected on 11kV, market settlement data will be used
 - For other generators connected on 11kV, market settlement data will be used
- Asset connectivity (i.e. where these are able to change their demand/parameters) - This changes with time and PSA needs to keep a record of via sensitivity factors
 - Asset connectivity (i.e. where these are able to change their demand/parameters) - This changes with time and PSA needs to keep a record of via sensitivity factors

* In our present setup, the PSA network model is the starting point for the Flexibility assets appearing in the NMF and assigned to an industry actor for participation in the market. This might or might not be the case for the new tools.

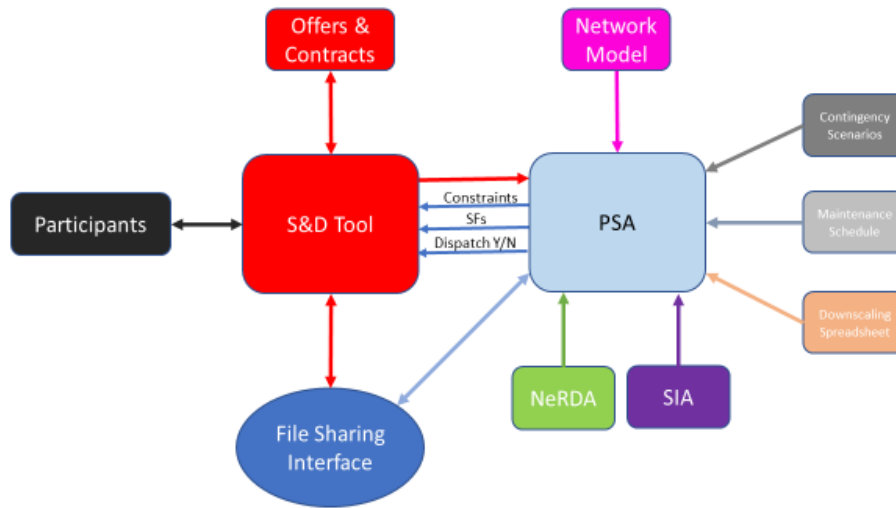


Context Diagram – PSA for TRANSITION Project



PSA and S&D Tool - Data View

SSEN view



Key dates :

Software to be ready to use on Tuesday **31st January 2023**

(this date includes an agreed 1 week delay incurred at start of engagement due to procurement process delay)

SSEN will undertake a 3 month trial period using software. Trials have a hard stop date, to complete by Wednesday **31st May 2023**

Objectives – what are we trying to achieve:-

Testing the end to end process for flexibility by:

- Incorporating short term operational forecast & topological datasets
- Calculating constraints on the network
- Advertising for offers to resolve constraints
- Receiving and assessing offers
- Validating offers and sensitivity factors
- Requesting dispatch(s)

Network/Service Scope**Network model focus is on:**

- Cowley Local BSP
- Rose Hill Primary

Using these service types:

- Sustain Peak Management SPM
- Sustain Export Peak Management SEPM
- Secure Constraint Management SCM
- Dynamic

Across these time horizons:

- Week ahead
- Day ahead

For network scenarios of:

- Base model (normal running arrangement)
- Maintenance (planned outages)
- N-1s (Unplanned outages, contingency scenarios)

Not testing (out of scope) :

- Within day time horizon for procurement process
- MIC/MEC services
- Peer to Peer transactions
- Financial settlement process for Participants
- Baselineing of measured utilisation data
- Edge cases (events that fall outside of the normal expected behaviour)

S&D language terms

Term	Description & Notes
Request	What the DSO determines is to be published amount of flexibility required. Avoid using term 'determine need' (as this is PSA) and avoid term 'Offer'
Response	What the trial participant Providers submit in reply to a request. Participants can cancel their responses up to when they are 'accepted' by DSO.
Contract	Is what is formed when the DSO accepts a response
FIAT instruction	This term is used after dispatch has begun and is an instruction that the DSO can make to instruct the flexible service to stop. FIAT is a Latin term meaning 'let it be done'
Dispatch notification	A communication using email which asks a contracted participant to provide a flexible service at a defined dispatch start/end time. Avoid using term 'intent to dispatch'
Forecast/analysis issue time	Refers to the time at which the forecast and/or the analysis is issued
Forecast/analysis target time	Refers to the time, in the future, for which the forecast and analysis were produced
Forecast/analysis lead time	The difference between the Forecast/analysis issue time and the Forecast/analysis target time
Dispatch instruction time	Refers to the time at which a notification is issued from SSEN to the participant, this instruction specifies the Dispatch start time and the Dispatch end time
Notification lead time	Time between Dispatch instruction time and Dispatch start time
Minimum notification lead time	Minimum time between Dispatch instruction time and Dispatch start time , as stated by market rules in the S&D (i.e. 12 hrs Sustain, 4hrs Secure and 30min Dynamic)
Dispatch start time	Refers to the time at which the flex asset is expected to import/export power from/into the network
Dispatch end time	Refers to the time at which the flex asset is expected to stop the import/export power from/into the network
Dispatch duration	The difference between the Dispatch end time and the Dispatch start time
Minimum utilisation duration	Refers to the minimum duration that a flex asset is allowed to dispatch, as stated by market rules in the S&D (i.e. a flex asset needs to dispatch for a minimum of 30 min)
Maximum utilisation duration	Refers to the maximum duration that a flex asset is allowed to dispatch, as stated by market rules in the S&D (i.e. a flex asset needs to dispatch for a maximum 2 hours)
PSA required duration	This is the required flex duration that is determined by the PSA and is regardless of any minimum/maximum utilisation duration relating to assets or stated by market rules in the S&D

List last updated: 26/10/2022 by KH