Update of Network models representation

Based on IEC 62559-2 edition 1
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1. Description of the use case

1.1. Name of use case

Use case identification		
ID	***Area(s)/Domain(s)/Zone(s)***	***Name of use case***
	Long-term planning	Update of Network models representation

1.2. Version management

Version management				
Version No.	***Date***	***Name of author(s)***	***Changes***	***Approval status***
1	2018-09-06	Nejc Petrovic		Approved Version

1.3. Scope and objectives of use case

Scope and objectives of use case	
Scope	This system use case describes the information needed for updating a network model representation from the previous version that was exchanged between TSO and DSO inside an observability area.
Objective(s)	Obtain more detailed insight into network conditions at responsibility area borders.
Related business case(s)	

1.4. Narrative of Use Case

Narrative of use case
Short description
This SUC describes the process to update the network representation for different services. The presented SUC uses the results of SUC "Definition of representative network equivalent in observability area" as base to the information exchange concerning the update of network representation.
Complete description
This system use case focuses on two main procedures required for optimal coordination of long term network development planning between DSO and TSO. The first procedure describes the process of updating a network model representation since the last information exchange between the TSO and the DSO related to long-term network development planning. This system use case uses the system use case Definition of representative network equivalent in observability area as one of the activities. The process focuses on establishing the changes between the previous version of the model that was exchanged and the newest version of the model. The identified changes are then packaged as a CIM change model according to the relevant standards. The second part of the use case focuses on the actual exchange of the change model and utilizes a Data Exchange Platform that both the TSO and the DSO use for their mutual exchanges.

The process can be triggered by either the TSO or the DSO. There is also a time-trigger related to ENTSO-E's network codes which state that such an exchange should take place every 6 months. If no updates to the network model from either the TSO or the DSO was made, or no future development plans have been altered in the last 6 months, the TSO and the DSO should exchange information that no relevant changes were made to the representative network equivalent in the observability area.

1.5. Key performance indicators (KPI)

Key performance indicators			
ID	***Name***	***Description***	***Reference to mentioned use case objectives***
1	Successful validation of combined network model in observability area		Obtain more detailed insight into network conditions at responsibility area borders.

1.6. Use case conditions

Use case conditions	
Assumptions	
1	Observability area between DSO and TSO is defined
2	DSO and TSO utilize CIM for network model exchange
Prerequisites	
1	Previous representative network equivalent exchanges are stored for comparison with updates to network plans
2	Refresh-rate: Must not be longer than 6 months
3	System Development Planning System is capable of Network Topology Processing
4	System Development Planning is able to change models

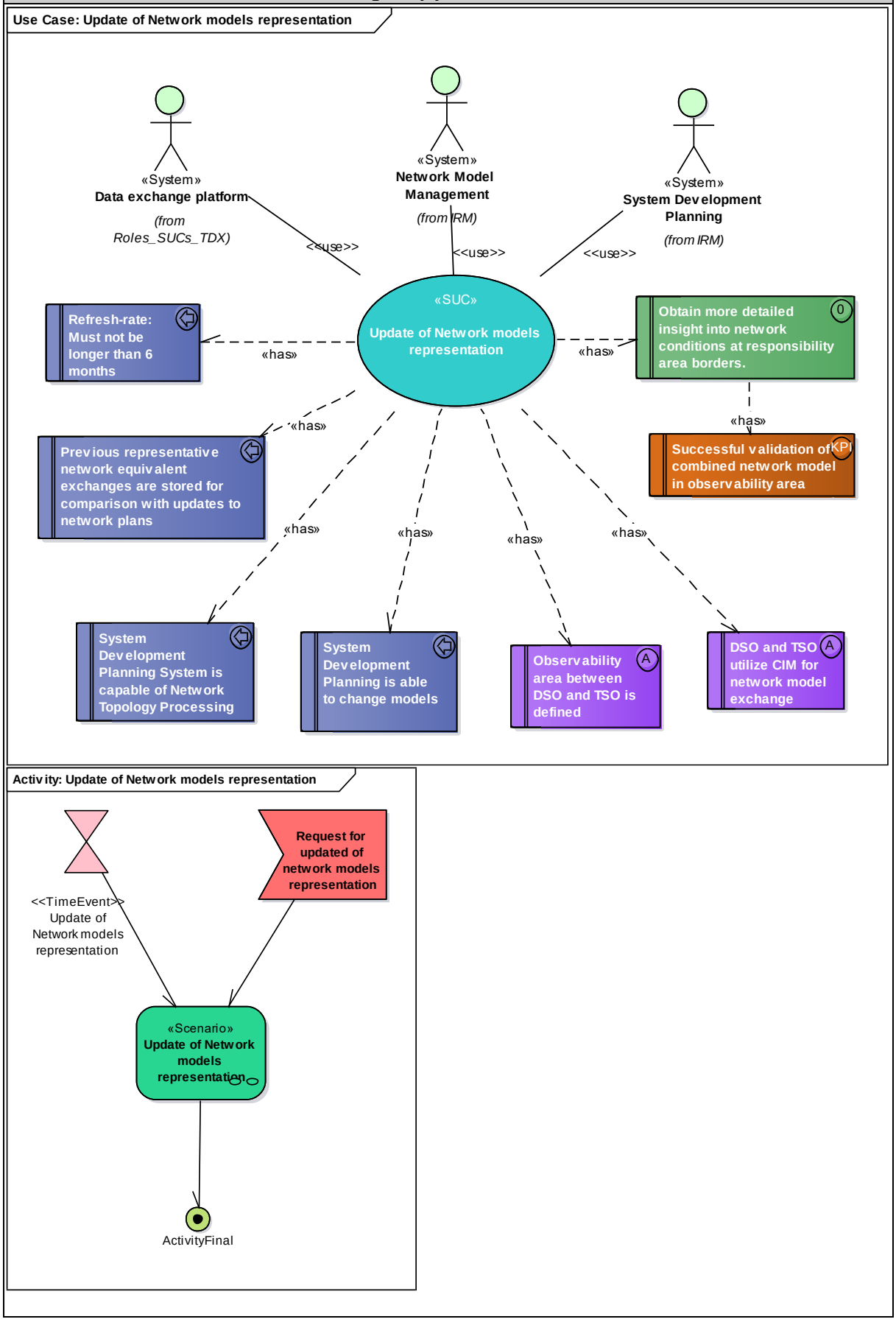
1.7. Further information to the use case for classification/mapping

Classification information
Relation to other use cases
<<BUC>> Coordination of long-term network planning between TSO and DSO. <<SUC>> Information exchange using a collaborative platform <<SUC>> Definition of representative network equivalent in observability area <<SUC>> Network model validation
Level of depth
Prioritisation
High
Generic, regional or national relation
Generic
Nature of the use case
SUC
Further keywords for classification
Network models, Observability are

1.8. General remarks

2. Diagrams of use case

Diagram(s) of use case



3. Technical details

3.1. Actors

Actors			
Grouping (e.g. domains, zones)		***Group description***	
Actor name	***Actor type***	***Actor description***	***Further information specific to this use case***
Network Model Management	System	The Network Model Management (NMM) manages information for establishing and maintenance of the functional description of the network grid that is provided by current installed asset (as-built model), planned installed asset (future model) or potential installation (what-if/ hypothetical model). The focus is to provide a mathematical model of the network grid that can be used in different analysis of the grid, including but not limited to steady state power flow, state estimation, contingency analysis as part of security assessment and stability analysis. It maintains master representations of the power system for network analysis functions, so that all analysis shares the same source information. Network Model Management (NMM) handles both internal enterprise element and cross entity both in the horizontal and vertical domain, e.g. TSOs-TSOs and TSOs-DSOs coordination.	
Data exchange platform	System	Platform used by several entities to exchange information for different proposes. The 3 type of data (Real-time; scheduled and structural data) can be exchanged in this platform. The operational/control data are not included in real-time type. The exchange of information related with the markets are included in the scheduled data. Data-agnostic ICT infrastructure that enables secured and reliable information exchange for different purposes and within different time scales.	
System Development Planning	System	The System Development Planning (SDP) business function involves network development and long term planning. The business function support cooperation and coordination to develop of a secure, environmentally sustainable and economic network system aimed at an adequate grid for the purpose of a well-functioning network operation and market operation. This is done through good planning with focus on future infrastructure characteristics, efficient asset management, critical infrastructure protection and system operability perspective.	

3.2. References

4. Step by step analysis of use case

4.1. Overview of scenarios

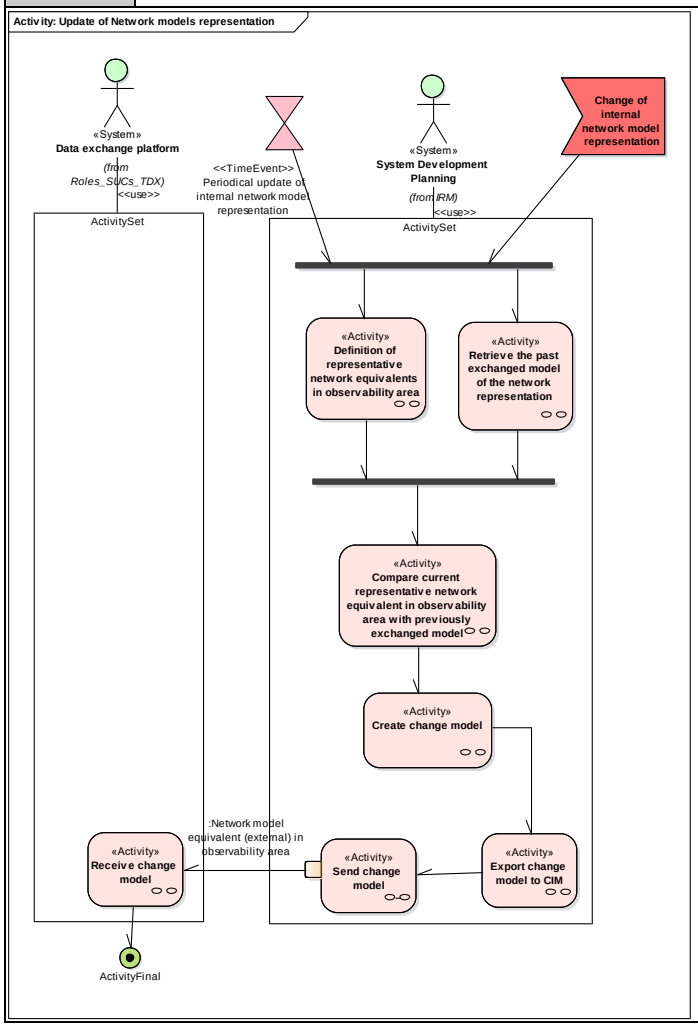
Scenario conditions						
No.	***Scenario name***	***Scenario description***	***Primary actor***	***Triggering event***	***Pre-condition***	***Post-condition***
1	Update of Network models representation			Update of Network models representation Request for updated of network models representation: Both TSO and DSO can request an updated version of the network models. This request is modelled in the SUC "Information exchange using a collaborative platform" in scenario "Long-Term Planning".		

4.2. Steps - Scenarios

4.2.1. Update of Network models representation

Scenario step by step analysis

Scenario	
Scenario name	Update of Network models representation



Step No	Event	Name of process/activity	Description of process/activity	Service	Information producer (actor)	Information receiver (actor)	Information exchanged (IDs)	Requirement, R-IDs
1.1		Retrieve the past exchanged model of the network representation	The system should have the last model exchanged in each observability area.		System Development Planning			
1.2		Definition of representative network equivalents in observability area	To evaluate the differences between the last exchanged model and the new network model, it is necessary to represent the network in the same format. This process is described in the SUC "Definition of representative network equivalent in observability area".		System Development Planning			
1.3		Compare current representative network equivalent in observability area with previously exchanged model	The recently created representative network equivalent should be compared to the representative network equivalent that was last exchanged with the requesting actor. Only differences between the representative network equivalents should be identified and extracted.		System Development Planning			
1.4		Create change model	Identified and extracted differences between the representative		System Development Planning			

			network equivalents should be defined in the sense what has to be created, modified and deleted in the upcoming information exchange.					
1.5		Export change model to CIM	Identified and extracted differences between the representative network equivalents defined with create, modify and delete actions should be transformed into a mutually recognizable, preferably standardized format for network model representation. The utilization of IEC 61970, IEC 61968, IEC 62325 series of standards is the most appropriate for this task.		System Development Planning			
1.6		Send change model	The System Development Planning department sends the constructed changes to the representative network equivalent in observability area in CIM format through the Data Exchange Platform to the partner who initially requested the model.		System Development Planning	Data exchange platform	Info1-Network model equivalent (external) in observability area	

1.7		Receive change model	The actor who initially requested the update to the representative network equivalent in observability area receives the change model through the Data Exchange Platform		Data exchange platform			

5. Information exchanged

Information exchanged			
Information exchanged, ID	***Name of information***	***Description of information exchanged***	***Requirement, R-IDs***
Info1	Network model equivalent (external) in observability area	Representation of network equivalent model in observability are using a CIM format using bus-branch representation. According the European grid-codes, the information object should include at least: Request ID Period Observability area ID Status [In validation, Validated, Changes Request] (a) Substation ID by voltage; (b) line that connect substations referred to in point (a); (c) transformers from the substations referred to in point (a); (d) SGUs; and (e) reactors and capacitors connected to the substations referred to in point (a). Type of information [Complete / Partial*] *The type of information "Partial" means that only some parts of the network are exchanged. This is useful to update the network information models.	

6. Requirements (optional)

7. Common terms and definitions

8. Custom information (optional)