**2) Limits for Switches**

The question is related to the task, how this limits can be modelled in our software. But we think to have a solution. In my understanding this current limit for switches needs to be provided only, if the switch is the limiting component on the circuit. If there is no switch being the limited component in a license area, no overall *OperationalLimitSet* and *CurrentLimit* referring to switches must be provided. Please confirm.

The ability to attach limits to the Terminals of devices (like switches) which are associated with circuits is specified in LTDS to allow DNOs who maintain limits at that level of detail to provide that information directly. It’s not required, however. (The Grid Modelling Guidelines say, “*If a device is a limiting element on a circuit, the cim:Equipment subtype object representing the device is associated with the circuit’s cim:Line (via either a cim:Equipment.EquipmentContainer association or via a cim:Equipment.AdditionalEquipmentContainer association) and can have one or more cim:OperationalLimitSet objects associated with one of its cim:Terminal objects*”.

A limit on one Terminal of ACLineSegment, however is required *“Every cim:ACLineSegment has at least one cim:OperationalLimitSet object associated with one of its two cim:Terminal objects”*. The limit value(s) are to be “*populated with a value reflecting the seasonal conductor ampere limit typically used in licensee planning and interconnection studies”*. This wording for the ACLineSegment-associated limits was intended allow DNOs flexibility while giving the LTDS model consumers good ‘real-world’ insight. We thought that making the ACLineSegment-associated limits reflect DNO practice would allow a DNO who maintained its circuit limits as a single value reflecting the lowest limit of all the elements associated with the circuit an easy way to provide the data.

Bottom line: The intent of allowing, but not requiring, device-based limits and requiring ACLineSegment-related limits to reflect DNO conventions/assumptions was to provide consumers with limits that were, all along the path of the circuit, appropriate to be used as violation limits. At the same time, we were trying to make what was required of the DNOs (and their vendors) as flexible as possible in terms of population requirements.

**4) EquivalentBranch**

I’m referring to the following sentence in section 4.3.2.11 on page 49 of the LTDS Grid Modelling Annex 1: Grid Modelling Guidelines:

*“More complex modelling of external areas is required when flows between connection points in the external grid have impact.”*

I think EquivalentBranches can be useful in such more complex modelling requirements. However, it should be possible to avoid the usage of EquivalentBranches by defining good positions for EquivalentInjections in the network reduction. But it may happen that the DNO is forced to reduce the network more than necessary in order to avoid the creation of EquivalentBranches. If this acceptable, we can forgo this object class.

I understand there could be use, both in a DNO’s internal model and externally, for a 2-Terminal equivalent and think it should be added to LTDS. We need to update not only the RDFS/SHACL rules, but also the Grid Modelling Guidelines to illustrate its use. On a related note, we’re meeting this Friday with Ofgem and a number of the DNOs to try to nail down how immediate ‘fixes’ like this should be handled.

**5) Short-Circuit Calculation**

This explains the small amount of SC data in LTDS and maybe also why the object class EquivalentNetworkInjection is not used. We’re missing fundamental SC data like the short-circuit power of the overlaying grid (represented by EquivalentNetworkInjection.maxInitialSymShCCurrent etc). Is intended to add this object class in the near future or do we have to deal with EquivalentInjection for all external connections?

There is no immediate plan to add the full set of SC input data to LTDS.

A side note, however: There are changes to the ESO/DNO data exchanges called for by the GB Planning Codes that will require a full set of SC input data to be shared by the DNOs with the ESO. Mapping of those requirements to the CIM has yet to be done but when it is your comment will become very relevant. There was also a discussion in a recent CIM WG13 meeting in Tokyo regarding the appropriate uses of the  EquivalentNetworkInjection and EquivalentInjection classes. Chavdar and I would be happy to talk further on this topic, if you’d like.