

Sistemas de Informação e Bases de Dados



INSTITUTO SUPERIOR TÉCNICO

SIBD Project - Part 1

| <i>Group Elements:</i> | <i>Hours:</i> | <i>Percentage:</i> |
|--|----------------------|---------------------------|
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Group: 29

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Shift: Segunda-Feira 09:30

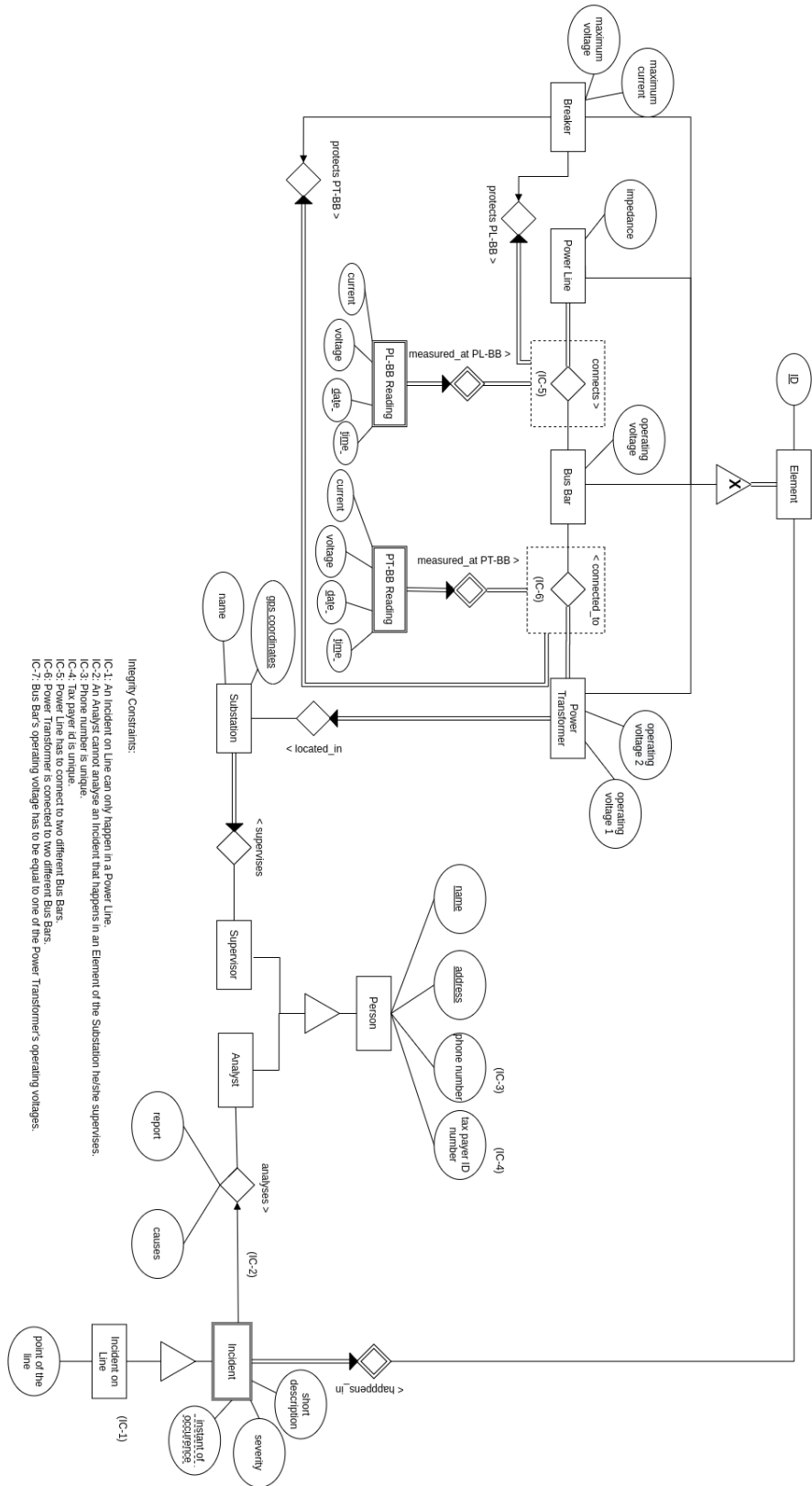


Figure 1: Entity-Association Model of a Power Grid

1 Notes:

The entity Readings is considered a weak entity. Readings can happen at the same time, so the attributes date and time are partial keys. Two Readings entities had to be created in order for each one to associate with one of the two connections. This choice was made in detriment to using Readings as a strong entity, due to the fact that a new primary key would have to be created only for this purpose.

The entity Incident is also considered a weak entity, since there could be different Incidents in different Elements at the same time, invalidating the use of instance of occurrence as a primary key. Thus, the primary key is the Element ID and the instance of occurrence is the partial key.

Each Power Transformer along with the Bus Bars is located in a Substation. The two Bus Bars' Substation is known through the Power Transformer they are associated with because this last entity is associated with the Substation.

Since each connection requires a Breaker, its participation in the association (Bus Bar - Power Line and Bus Bar - Power Transformer) should be mandatory, which means that a connection cannot exist without being associated with a breaker. In terms of multiplicity, the association should be one-to-one so that each connection can only be associated with at most one breaker and each breaker can only be associated with at most one connection.

The system keeps the same information for each Person (name, address, phone number, tax payer ID number). However, a Person can be specialized in supervising a substation (supervisor) or analysing in case of an incident (analyst). These different roles were best expressed recurring to a specialization with no constraints, meaning that a person can be an analyst, a supervisor, both or none of them. It was assumed that there can be people in the system that are neither analysts nor supervisors.