

DEXPI2graph

Process Intelligence Research
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**Process
Intelligence**
RESEARCH

Requirements

- Dense graph
 - Good for machine learning
 - Good for LLM integration
 - Good for manual graph drawing
- Important attributes to include
 - NominalDiameterStandard
 - FluidCode
 - (PipingClassCode)
 - (OperatingTemperature)
 - (OperatingPressure)¹

[1] not a DEXPI attribute, Nozzle has NominalPressure

Classes to be nodes

- NozzleOwner
- PipingNetworkSegmentItem
- ProcessInstrumentationFunction
- SignalOffPageConnector
- ControlledActuator
- Positioner
- ElectronicFrequencyConverter
- OfflinePrimaryElement

Classes to be edges

- PipingConnection¹
- SignalConveyingFunction²
- OperatedValveReference
- ElectronicFrequencyConverter³

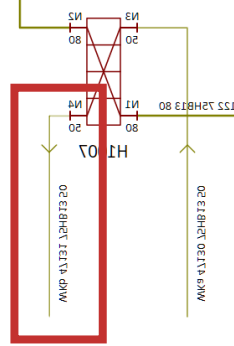
[1] Includes Pipe and DirectPipingConnection. For every PipingConnection, we add all attributes of the PNS that it is part of.

[2] Includes SignalLineFunction and MeasuringLineFunction

[3] Included for now as edge type, need to be verified with DEXPI example

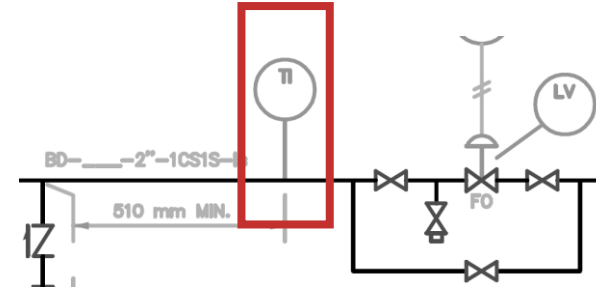
Points of concern

- Loose pipe end/start



→ not considered

- ProcessInstrumentationFunction (PIF) referencing PNS



Should not occur according to DEXPI, rather PIF is connected to PipingComponent

- HeatExchanger connectivity information stored in chambers, but chambers not included as nodes

get information from chambers, store as extra edge attribute. Not implemented yet

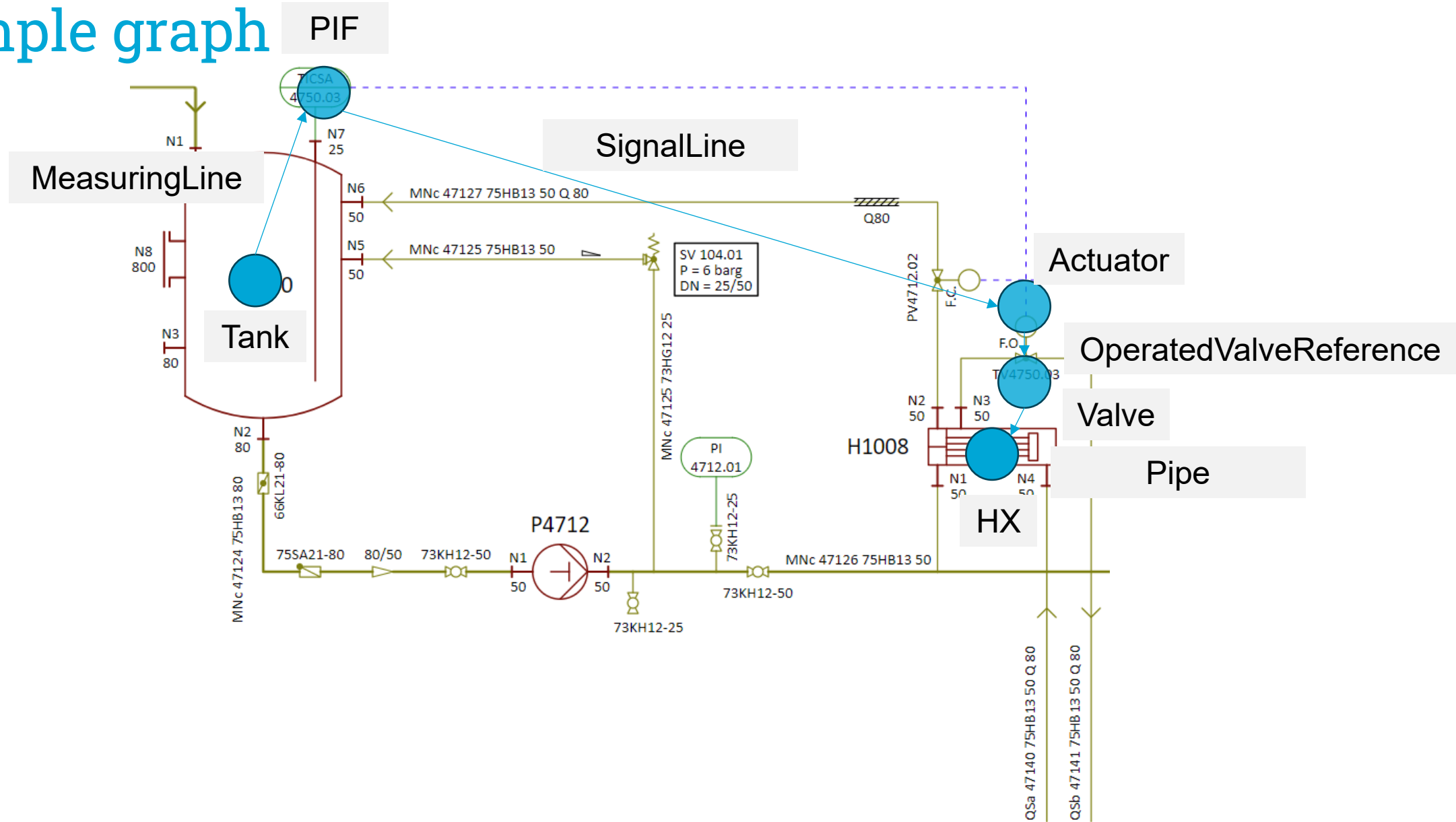
- How to save component position as node position?

Extra attribute for every node: Point[x:float,y:float]

- Custom classes that are not a subclass of any class already included? E.g., CustomActuatingElectricalSystemComponent

Don't worry about it for now. If they Occur: implement for every class a Special case

Example graph



Thank you very much for your attention!