Flexibility Issues in CCS Networks: Initial findings from the FleCCSNet project

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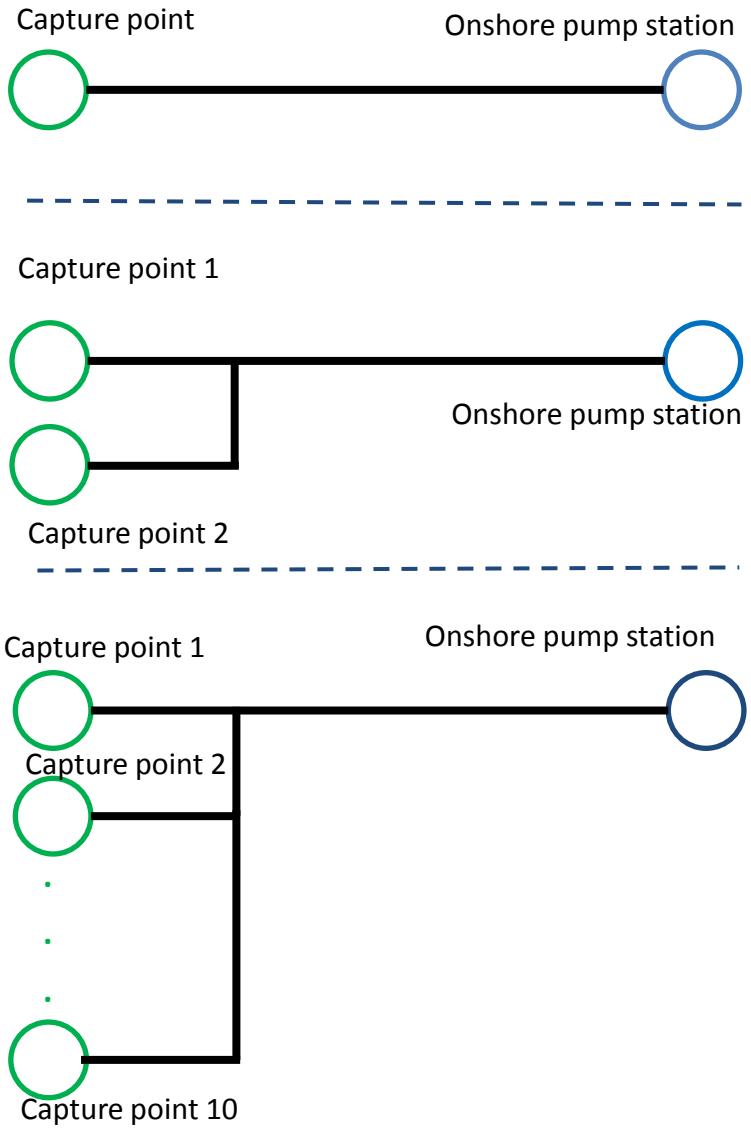
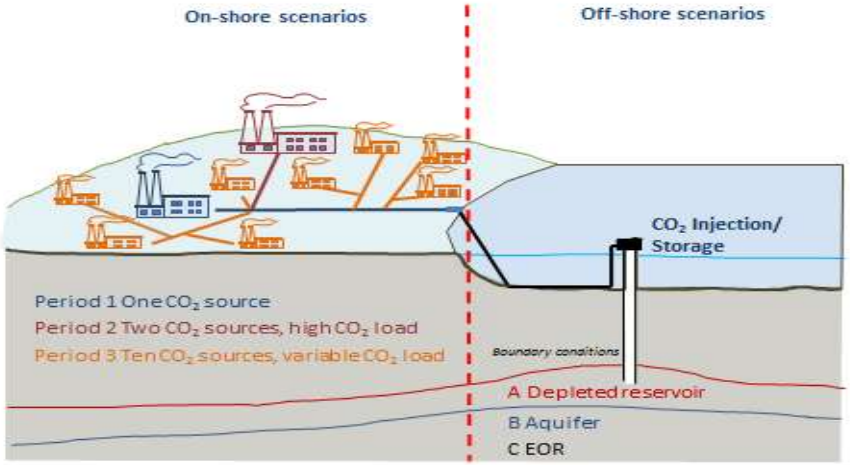
Onshore Scenarios





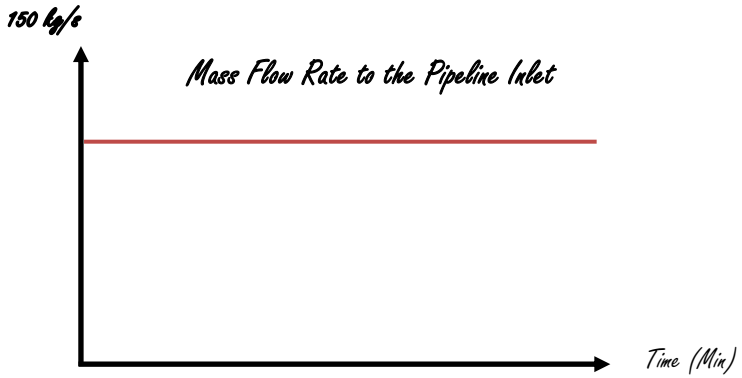
Modelling assumptions for dense phase pipeline

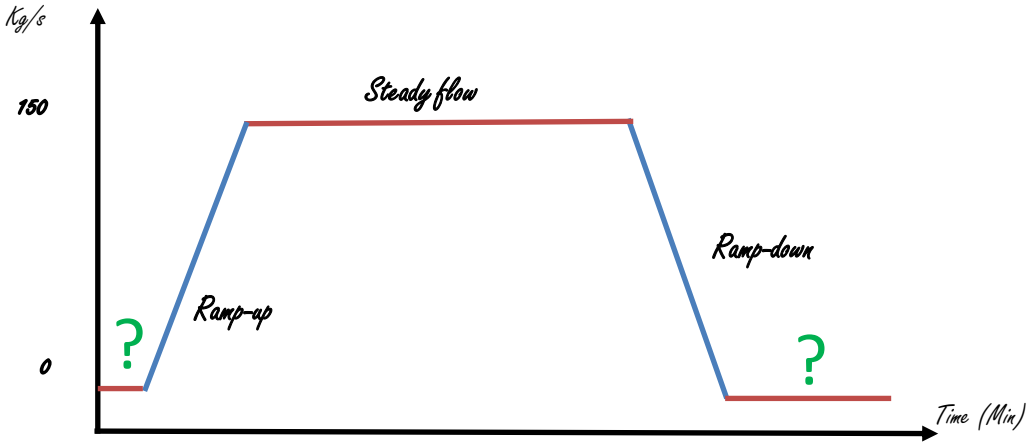
PARAMETER	VALUE	UNIT
Rate of Undulations	0	/1000
Horizontal Distance	15	*km*
Elevation Difference	0	*m*
Roughness	0.0457	*mm*
Ambient Temperature	5	°C
Inlet Pressure	110	bara
Internal Diameter	437	mm
Wall Thickness	10	mm
Mass flow rate	150	kg/hr
Inlet Temperature	30	°C
Burial depth	1.1	*m*
Specific heat [2]	490	J/kg-C
Steel Heat Transfer Coefficient	60.55	$W/m^2/K$
Soil Heat Transfer Coefficient[3]	2.595	$W/m^2/K$

Pipeline lengths: 15, 50, 100, 150km

Inlet Pressures: 110, 150 bara

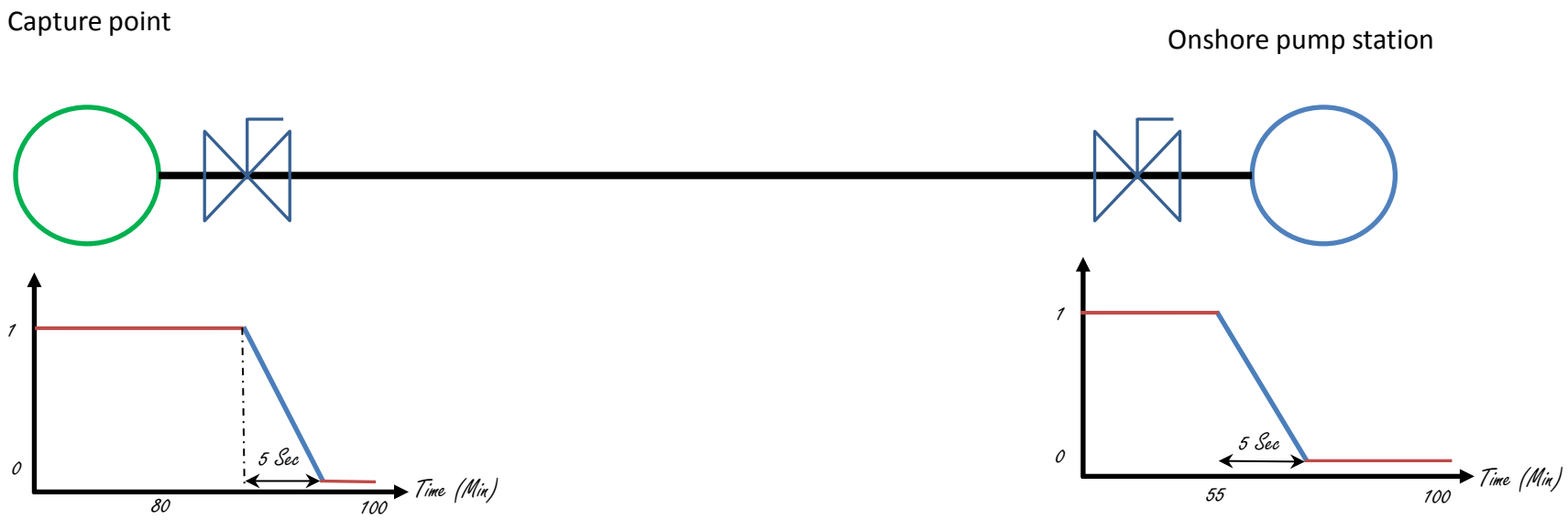
Load Types



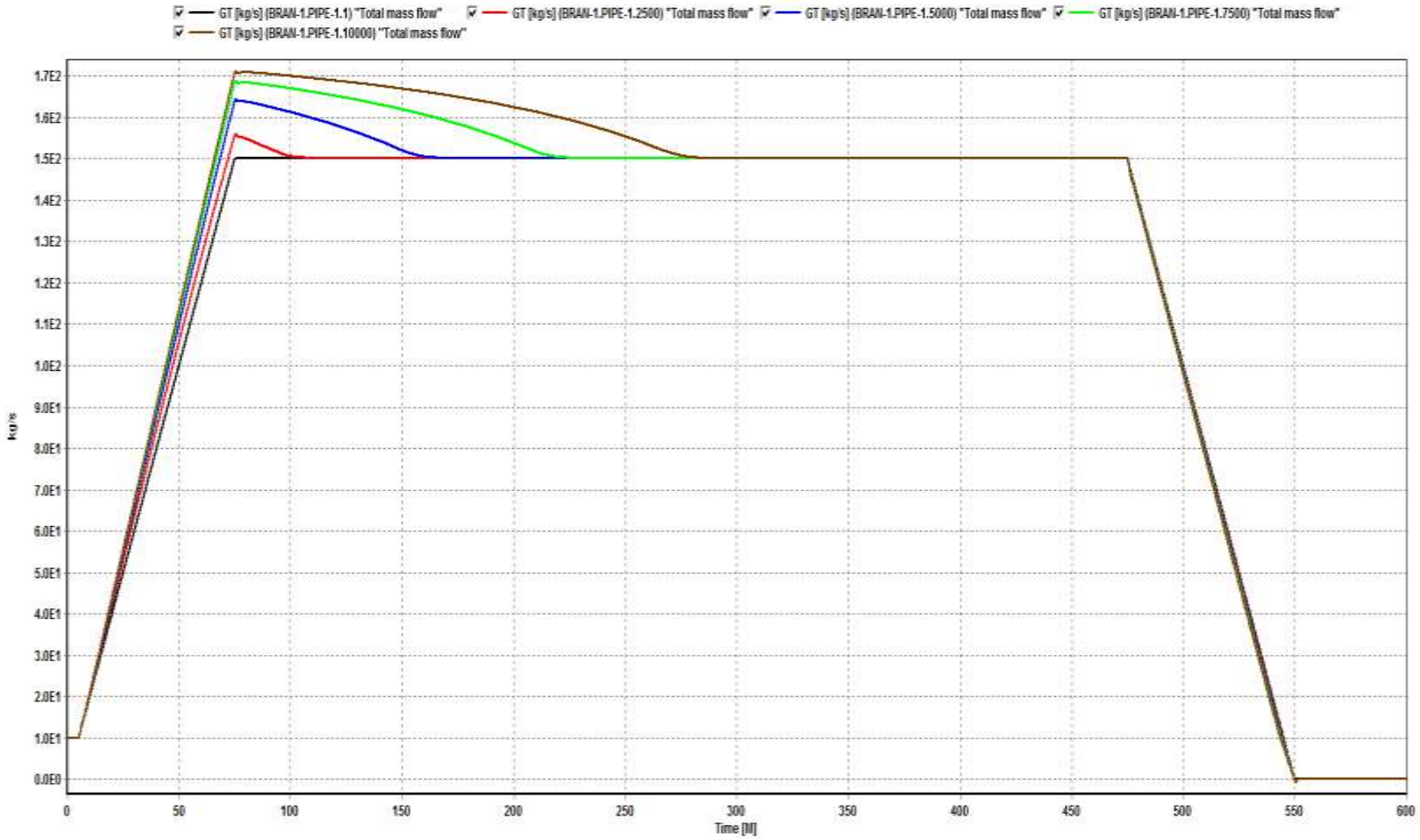


Minimum flow rate before shut down?

Effects of valve shut down timing



Result; Synopsis



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Summary

Explored dense phase CO_2 transportation for Period-1 and Period-2 under flexible operation conditions.

Investigated the linepacking capability of the pipeline, and the drawn conclusions regarding the optimum shutdown time of the inlet valve and outlet valve.

In the network of Period-2 type, the effects of differences in the load profiles and also the effect of different load profile timings between the two emitters on the flow pattern in the network are under consideration.

Announcement

2nd Workshop on the achievements and progress of
Flexible CCS Network Development

Monday 18 MAY 2015

Newcastle University,
School of Marine Science and Technology

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