Automating OLGA with FLUX

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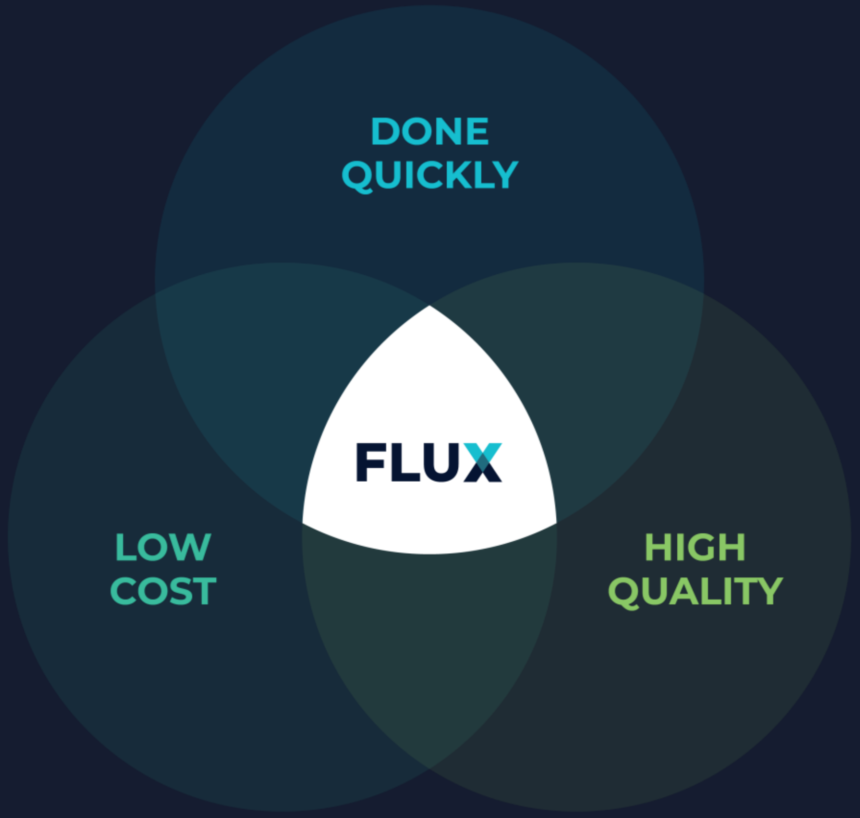
Automating OLGA with FLUX

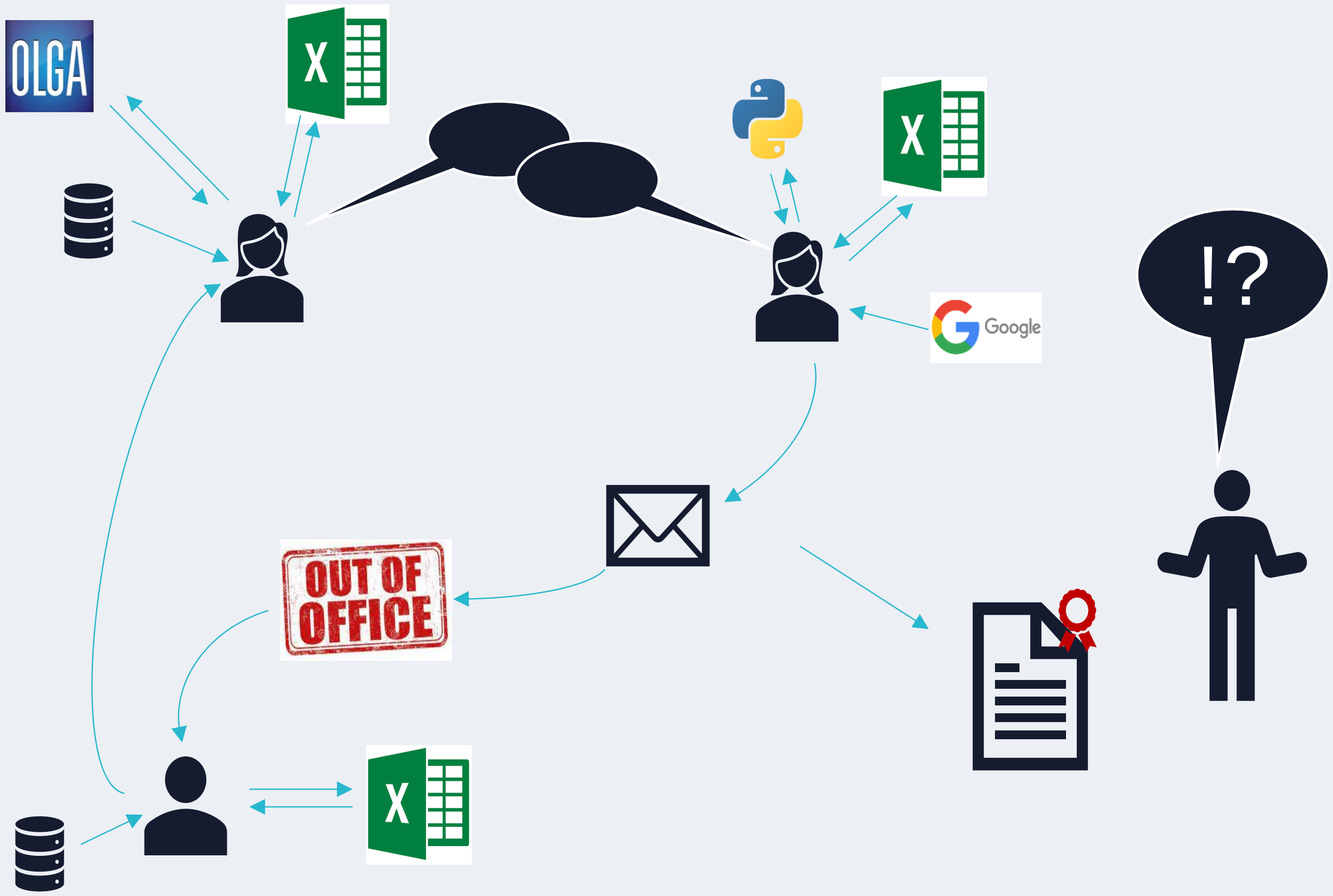
- Manual Engineering Workflow
- Power of Automation for OLGA
- FLUX
- Value Realisation – CCS Injection
- Advanced Visualisation



Complex Engineering Workflows

RISKS

- Multiple data sources
- Uncontrolled calculations
- Inefficiencies
- Communication
  - Revised Basis
  - Results between disciplines
  - Outcomes to stakeholders



Manual OLGA Parametric

Manual duration ~ 3 weeks

Traditionally would Analyse 20-50 sensitivity cases

Define basis & assumptions

2 days

Model Build

2 days

Create parametric matrix, run simulations & extract results

5 days

Extend matrix for better definition and re-run

3 days

Automated OLGA Workflow

Automated duration ~ 1 week

Can assess thousands of sensitivities in *less* time

Define basis & assumptions	Model Build / Generate Simulation File	Create parametric cases (sensitivities)	Run simulations	Extract Relevant Data	Visualise Data
2 days	2 days	2,300 cases 30 seconds	~ 1 day	1 hour	30 seconds

Introducing FLUX

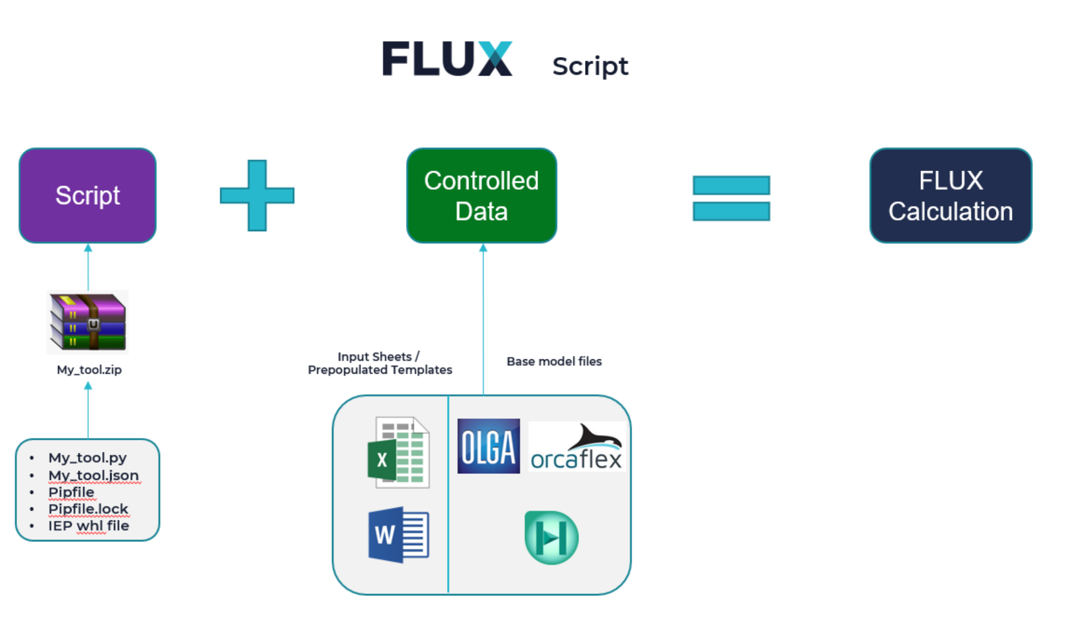
Xodus Inhouse Integrated Engineering Platform

WEB APPLICATION
Access Globally
Controlled QA'd Scripts and Calculations
Cross working locations
Client Access

EXECUTES AUTOMATED TASKS
Python Scripts
Controlled Calculations
Calls up Software – Executes Analysis
Extracts Results
Iterates to Solutions
Graphical Outputs

STORES DATA
Digital Design Basis
Single Data Source for all Disciplines
Outputs from analysis held as Inputs for other disciplines
Management of Change Control

- Create a Project
- Create a Workspace
- **Upload your FLUX Script**
- Check-in / Check-out
- Create a Calculation
- Construct the Workflow
- Execute a Calculation
- View the Results
- Execution History



Script:
Upload the approved script into the workspace

Controlled Data
The term Controlled Data refers to any data that is uploaded and stored in FLUX

- The version/upload history of the Controlled Data will be tracked
- The Controlled Data can be passed as inputs to Calculations.

- Create a Project
- Create a Workspace
- Upload Controlled Data
- Check-in / Check-out
- Create a Calculation
- **Construct the Workflow**
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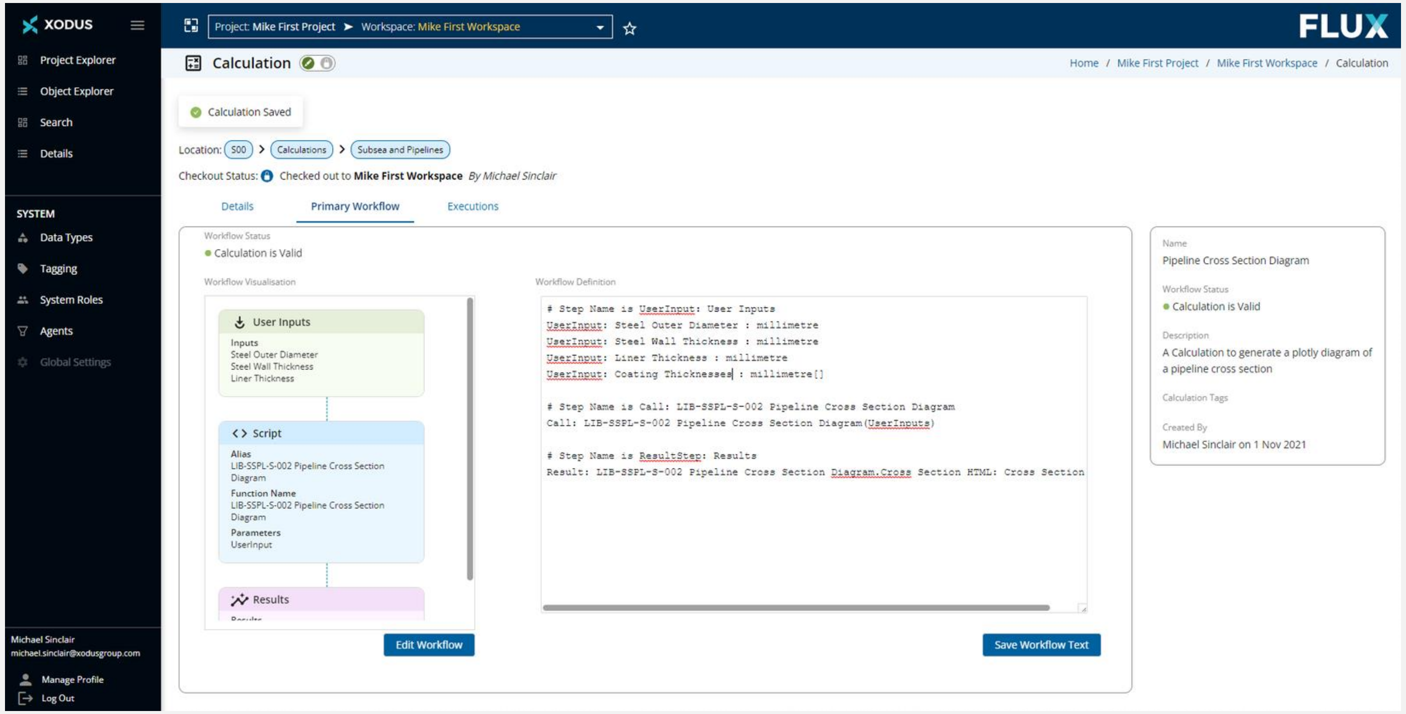
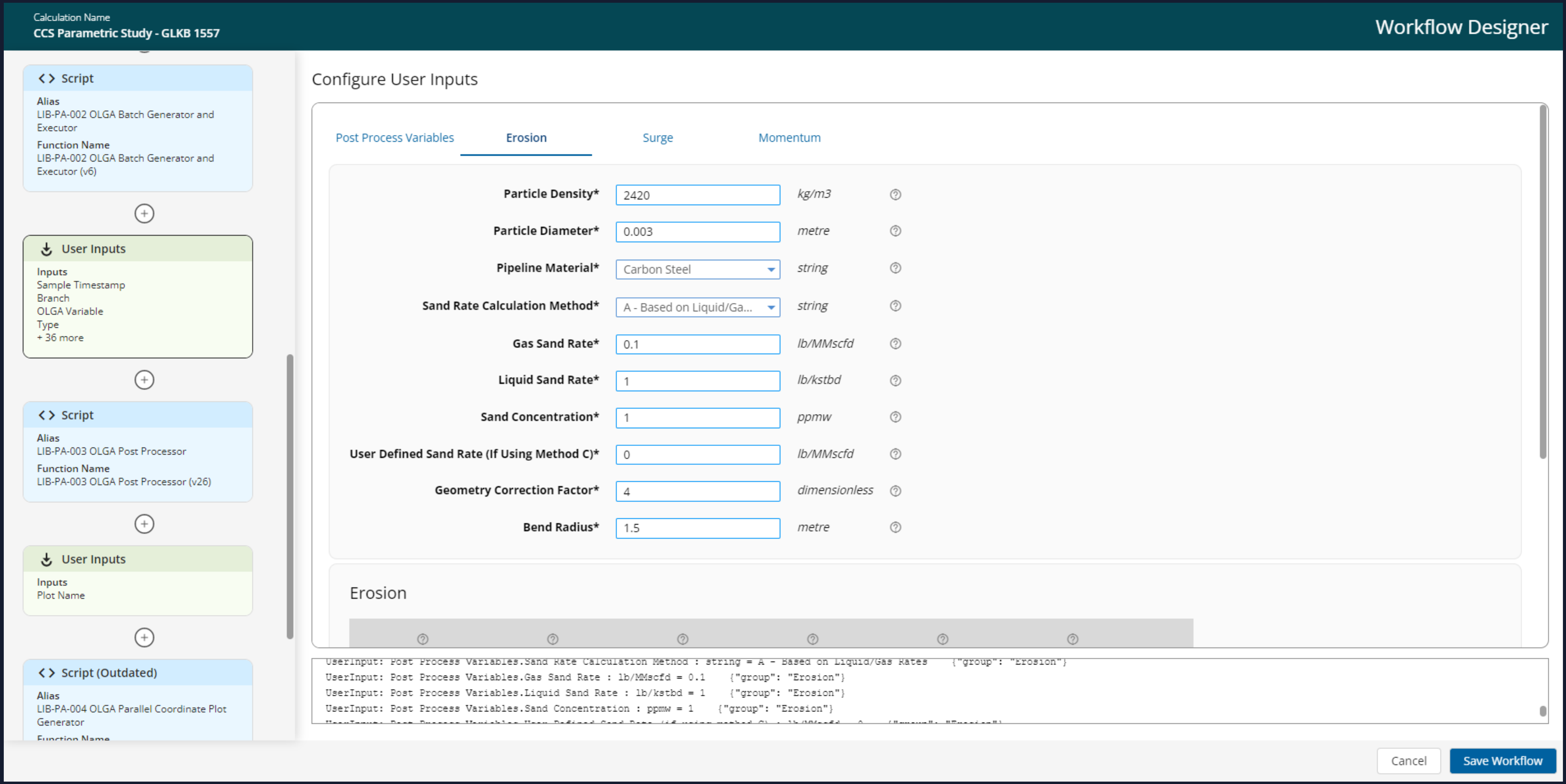
The Workflow is used to:

- Describe the inputs and outputs of the *script(s)* to be executed
- Assign Controlled Data to the *script(s)*
- Define the order of *script(s)* to be executed
- Define which outputs to be shown on the Results page on an execution



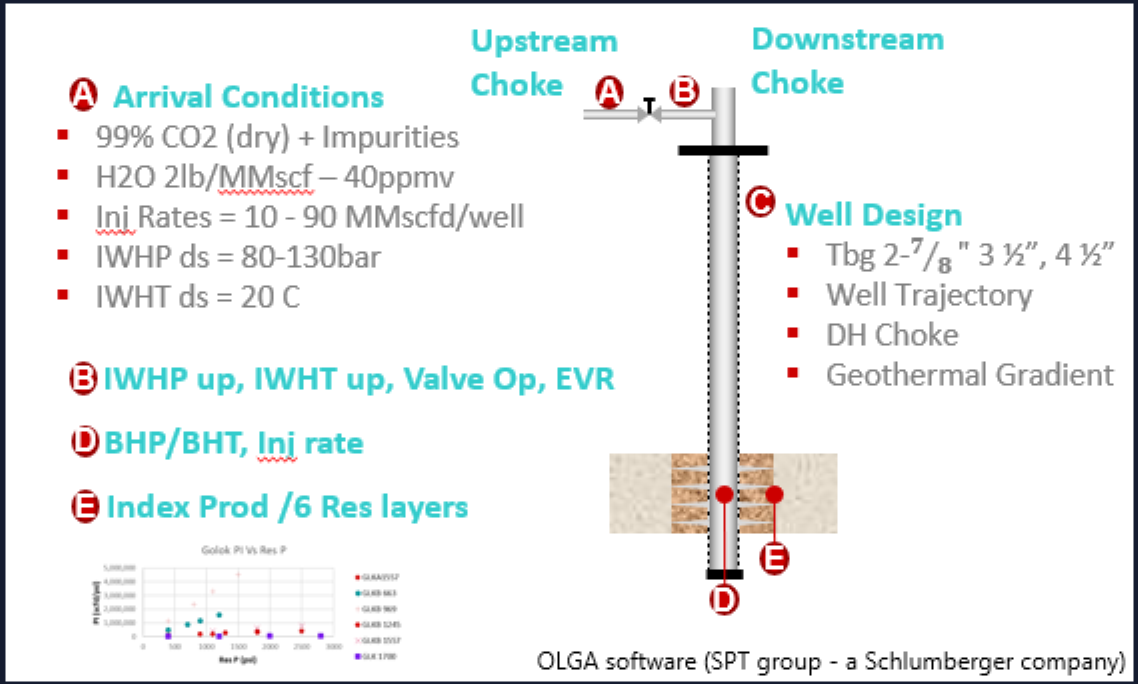
Example Automated Calculation - DNV RP501 Erosion



FLUX CO_2 Wells Injection Case Study

CCS Feasibility Project

- Injection into depleted (low pressure) Reservoirs
- Multiple Well Options and Injection Targets
- Low Pressure Reservoirs
- CO_2 Phase change risks

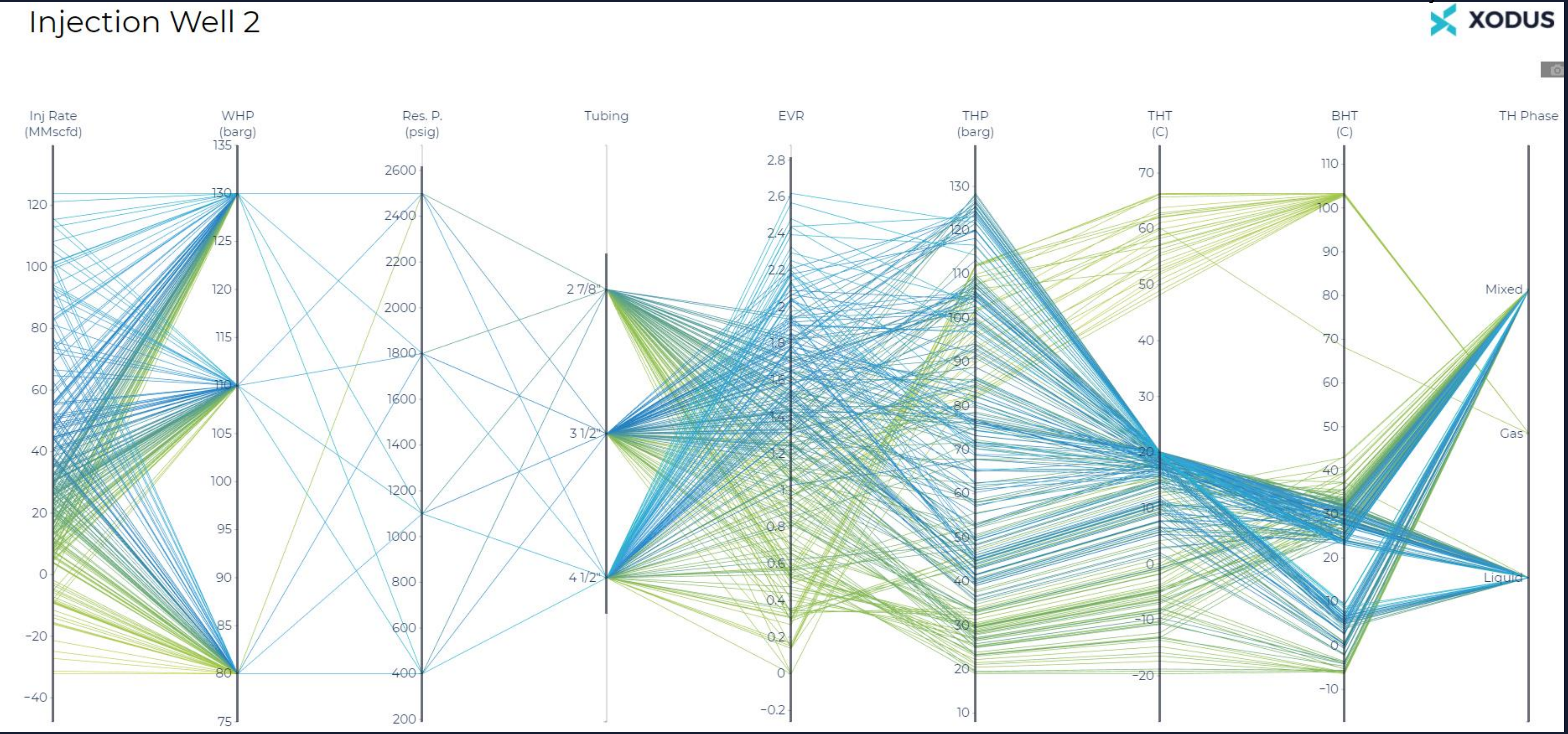


Value realisation of FLUX

- A typical 4 week job completed within 1 week
  - A total of 1,300 sensitivity cases were assessed and communicated through FLUX
  - Early insights dramatically streamline early phase engineering
  - Identified that smaller tubing sizes could be discounted early (saved well engineering on non practical scenarios)
- Additional focus areas were assessed quickly and efficiently
  - Option and benefit of a downhole choke assessed within a day
- Data visualisations proved a powerful communication tool

Example Interactive Multi-Parameter Plot

Injection Well 2.html



Thank you for your attention

Questions?