

Sieger

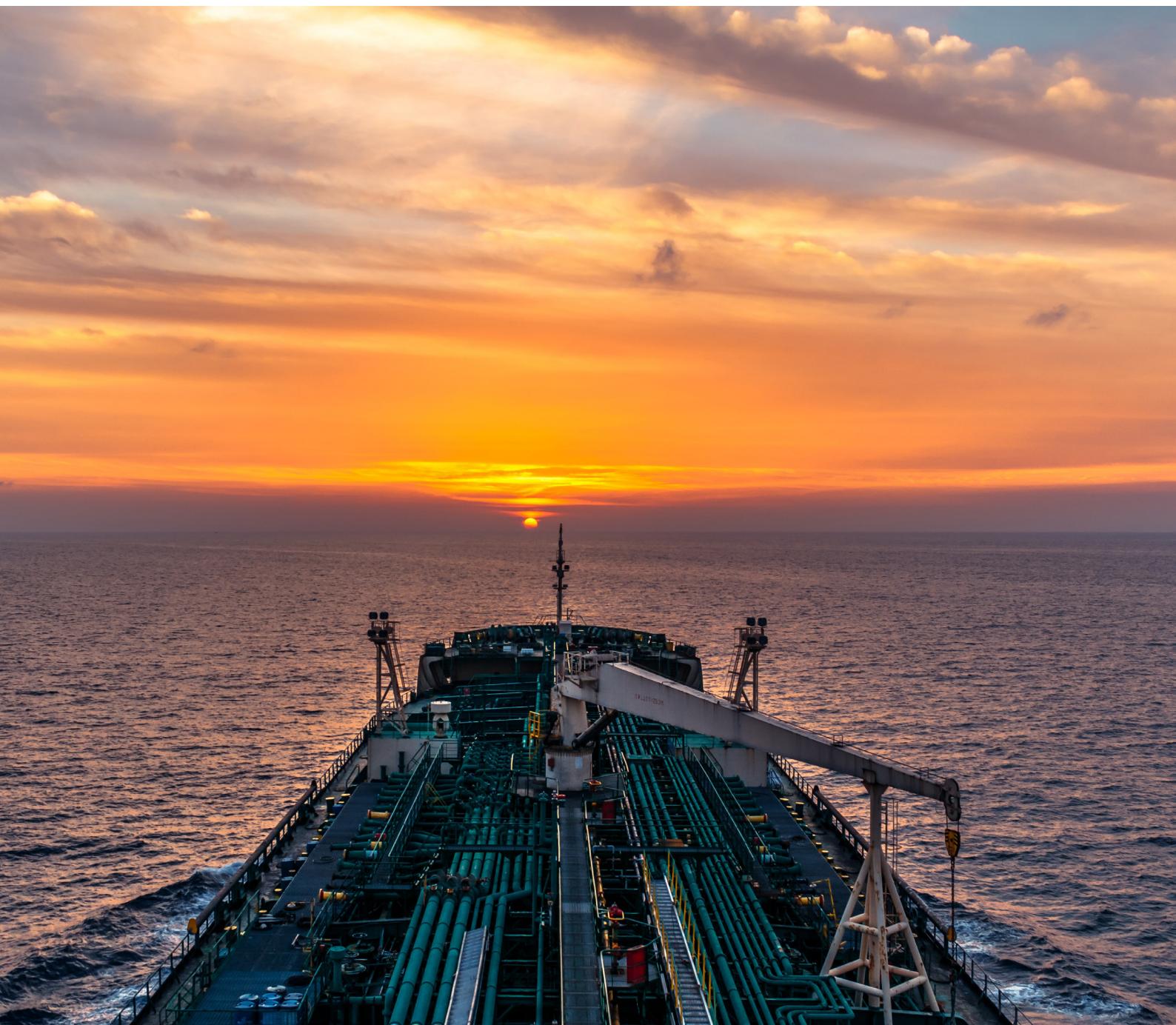
www.siegerand.co



About Sieger & Co

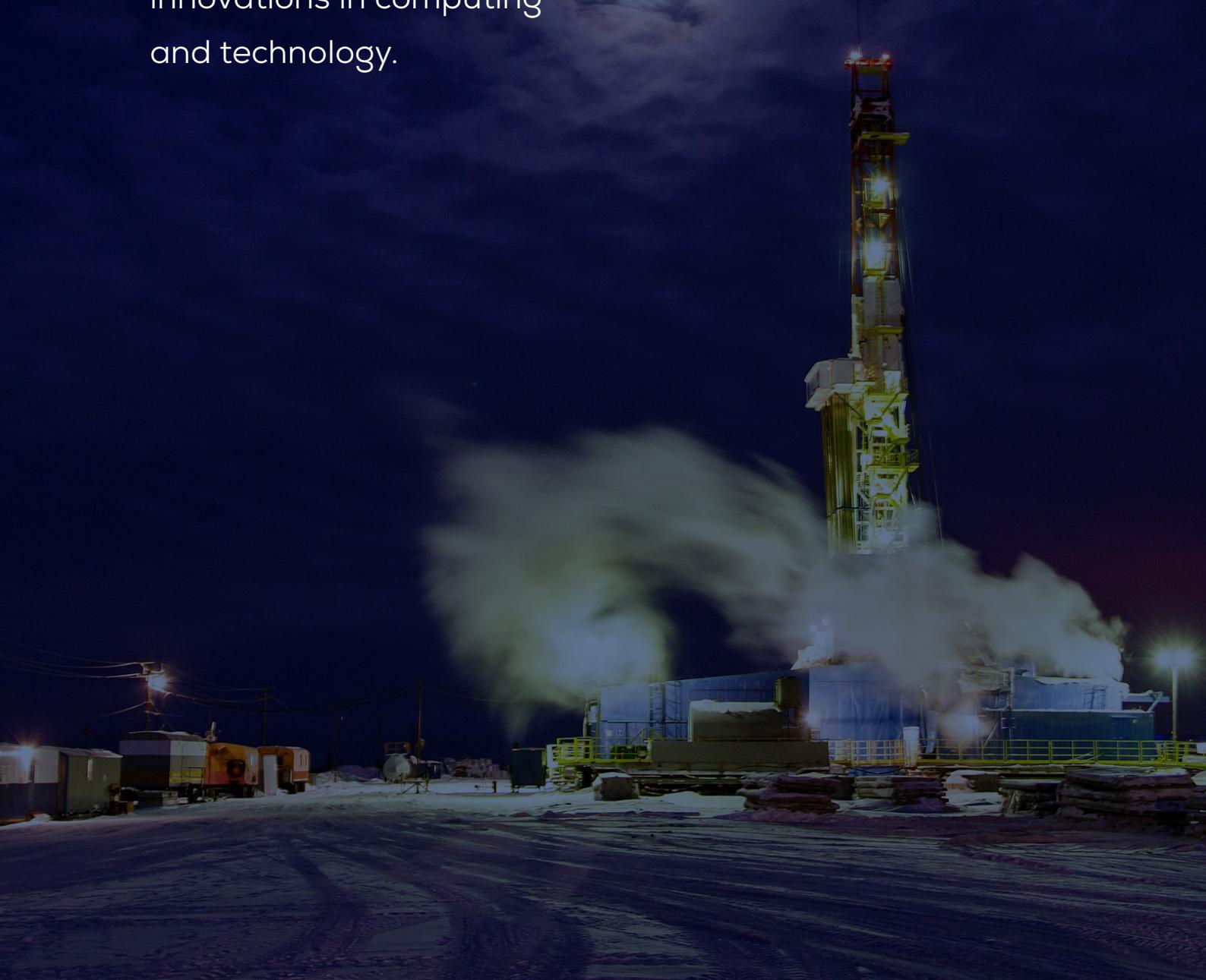
Sieger & Co Limited is an **energy software development** company operating out of Lagos, Nigeria.

Sieger provides solutions across various computing disciplines to clients depending on their unique requirements. We pride ourselves on being at the **cutting edge of computing** and **engineering innovation**, and thus wherever possible, we strive to apply the **latest technology** to our development work in order to deliver the benefits of those breakthroughs to you.



**we provide solutions to
the challenges of the
oil and gas industry –**

ensuring that energy
companies can benefit
from breakthroughs and
innovations in computing
and technology.



AREAS OF EXPERTISE

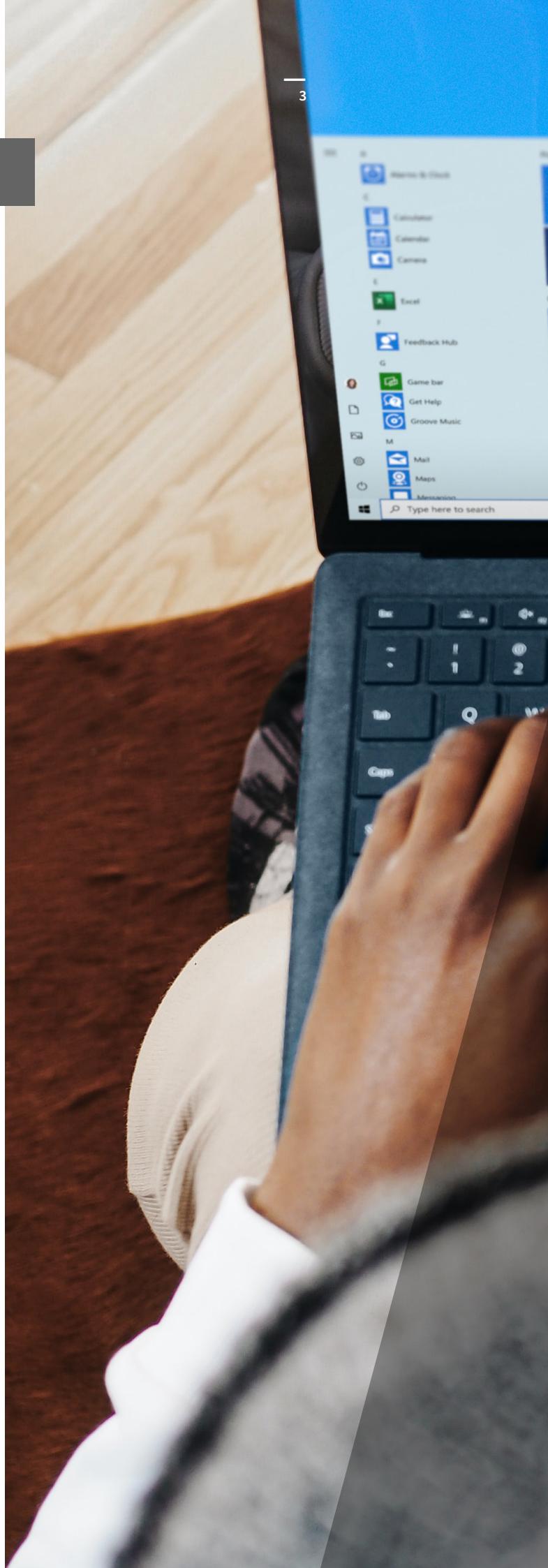
Bespoke Application Development

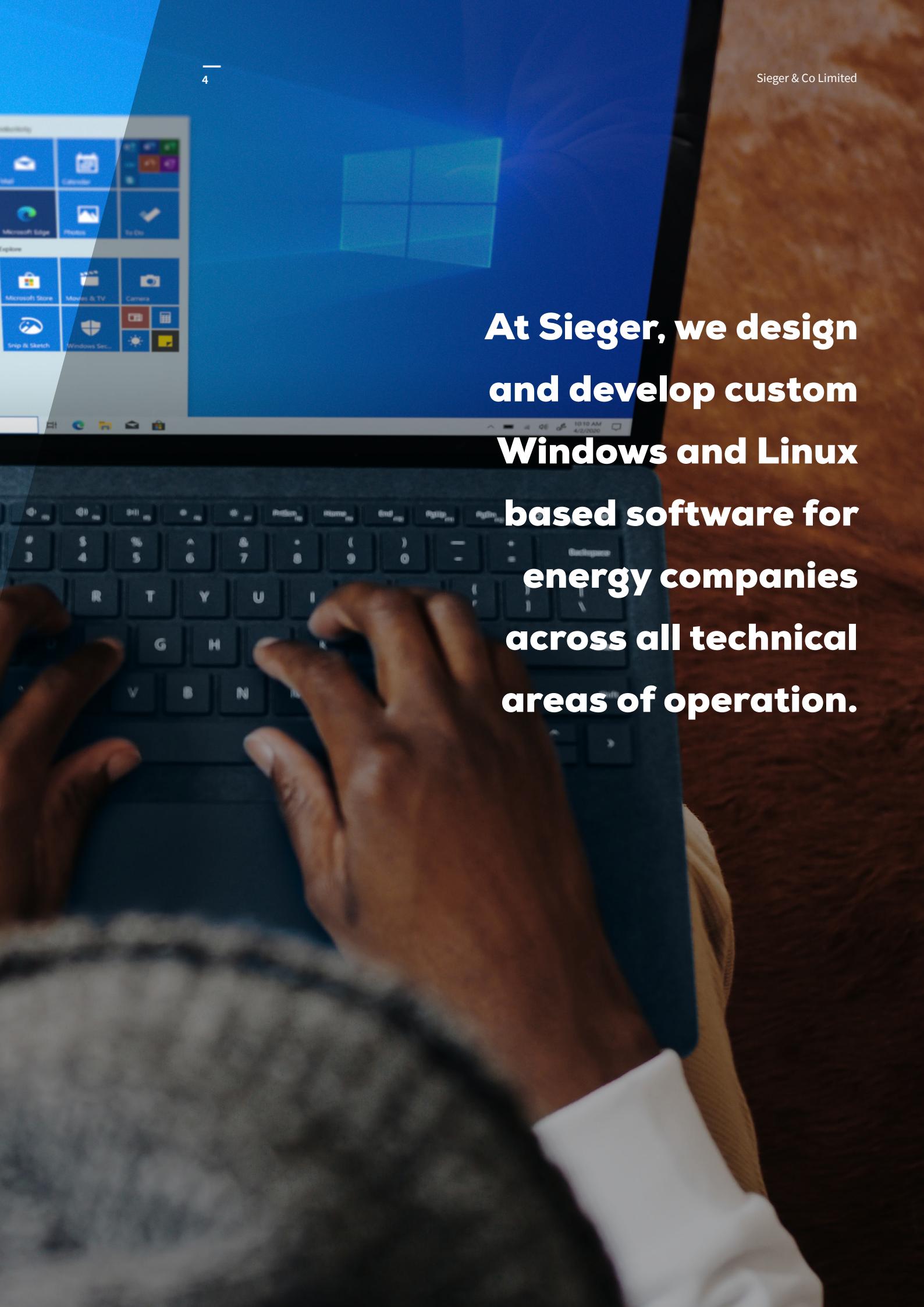
Our software developers have built and successfully deployed various software solutions to oil producing companies in Nigeria.

These solutions include software that uses computer vision to enable accurate and efficient reservoir depth-area delineation from contour maps, Monte-Carlo based probabilistic GRV estimation software, PVT analysis and matching software, and a production forecasting tool capable of extracting production data from any production database and using this data to generate field wide production forecasts (using C-Curve, Logistic Growth, Arps DCA or Machine Learning) which can then be constrained due to export or commercial limits as required.

These applications ensure that the benefits of computing innovations (such as multi-threaded CPUs/GPUs, and Artificial Intelligence/Blockchain Technologies et cetera) are realized by oil and gas companies in terms of improved operational efficiency and lower operating costs.

They also bridge the gap between the software solutions required by a company's in-house technical staff, and what is commercially available on the market.



A close-up photograph of a person's hands typing on a dark-colored laptop keyboard. The laptop screen displays the Windows desktop interface with various icons like Mail, Calendar, Microsoft Edge, Photos, To Do, Microsoft Store, Movies & TV, Camera, and Snip & Sketch. The text "At Sieger, we design and develop custom Windows and Linux based software for energy companies across all technical areas of operation." is overlaid on the right side of the image.

**At Sieger, we design
and develop custom
Windows and Linux
based software for
energy companies
across all technical
areas of operation.**

AREAS OF EXPERTISE

Private, Public or Hybrid Cloud Computing

Web based software applications have one major advantage over native applications – versatility.

This versatility is largely due to the fact that web-based applications can be accessed on any device at any time, and the results of analyses can more easily be shared with multiple users within an organization.

In addition, since the ‘heavy lifting’ in web-based applications can be carried out on the application server rather than on the device, complex and computationally intensive tasks can be run on any type of device, regardless of the computing power of the device itself.

These solutions are accessible by users on any device, anywhere in the world. They grant users access only to the functions or capabilities available to them based on their role in the company, and secure sensitive data using enterprise grade encryption either in a database, or during data transmission.

Our cloud solutions can be deployed to either public/shared cloud, private cloud or some mix of both options, depending on client and regulatory requirements.



Cloud-based applications take this versatility one step further by removing the complexity inherent in setting up and managing in-house web/application servers, further reducing the downsides of web-based software.

AREAS OF EXPERTISE

**Mobile App
Development**

We design and develop Android and iOS mobile applications for energy companies.

These mobile applications can fulfill myriad functions including providing dashboards and reports on the operational status of various aspects of an asset to stakeholders, incident management and reporting by field personnel, calculations and/or data retrieval while out of office, et cetera.

Like cloud computing, mobile applications provide users with the ability to work from any device and any location they choose. Mobile applications can also be combined with cloud or native applications to create a seamless operating experience.

For example, a field worker can provide data on a mobile device via an app which saves this data into a company database for consumption on another (native, web or mobile) application by another user; or an engineer could initiate a calculation on a workstation at the office from their mobile device and have the results sent back to their mobile device once the calculation has been completed.

Sieger uses mobile apps to improve operations for energy companies in this way.



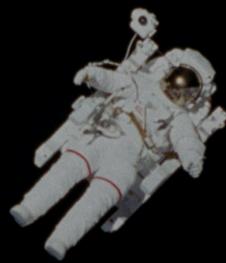
AREAS OF EXPERTISE

Emerging technologies

Artificial Intelligence has recently come to occupy a prime place in computing research.

The discoveries brought about by research in this field have led to data processing and prediction speeds several orders of magnitudes faster than anything previously available.

Blockchain technologies have also revolutionized data storage, and their use can bring several operational advantages in certain specific scenarios.



Sieger creates and deploys machine learning models to aid in data interpretation, decision making and problem solving. From reinforcement learning, to machine vision and deep learning, we apply machine learning towards solving oil and gas problems.

We are also capable developing and deploying blockchains in situations where trustless systems are required.

In addition to those capabilities, we also handle projects involving:

- **Data Management and Analytics**
(Dashboards and Reporting using Tableau and Power BI)
- **Robotics**
using drones and UAVs for the purposes of aerial surveillance et cetera)





Showcase Projects

A few of Sieger's projects that showcase our capabilities in our areas of expertise are listed here.

PE (Petroleum Engineers) Workbench



PE Workbench is a tool built and maintained by Sieger which is currently being used by multiple energy companies in Nigeria.

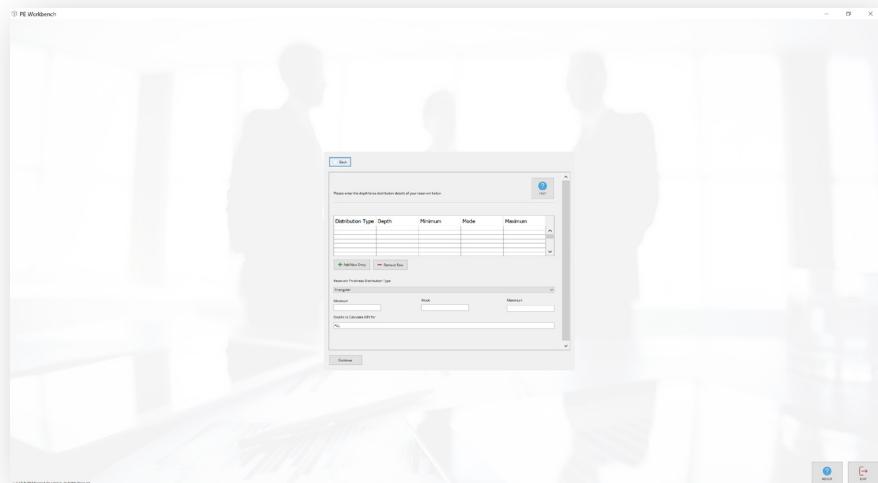
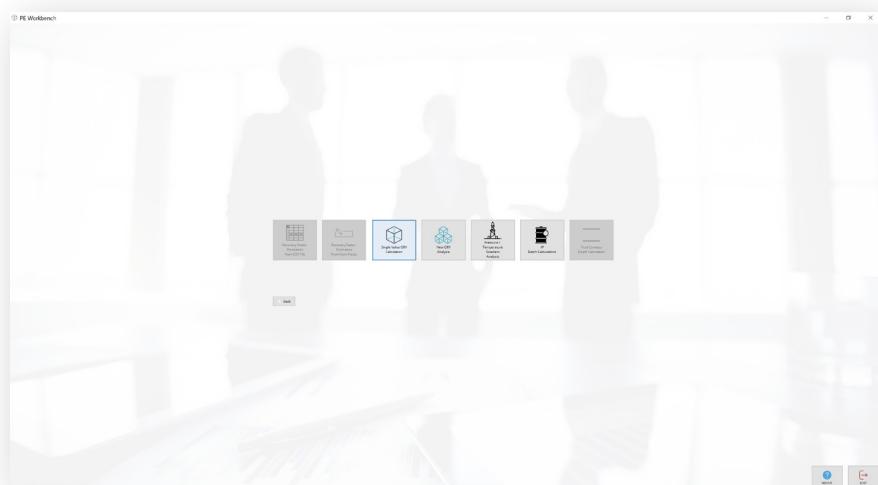
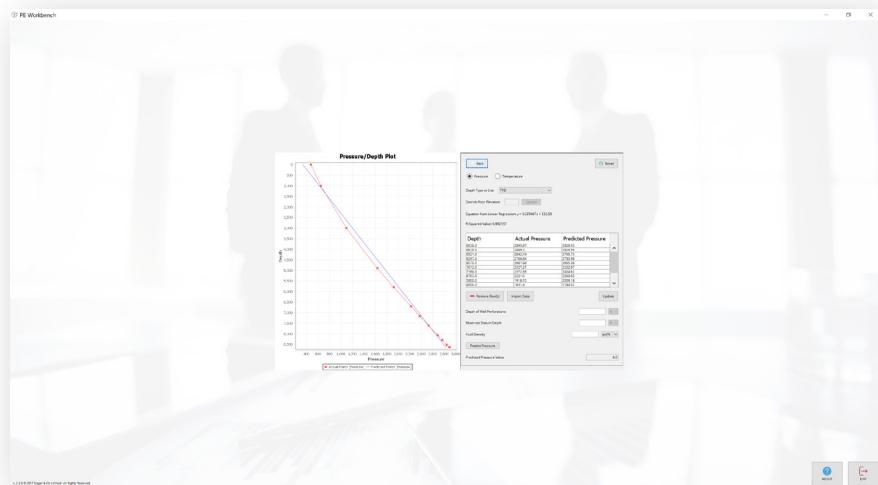
PE Workbench is used by Reservoir Engineers at these companies to carry out deterministic and probabilistic GRV calculations from input distributions of reservoir depth-area pairs, and for batch reserves estimation for multiple reservoirs at the same time.

Both these requirements were previously being met with the use of other tools, but they proved far slower and

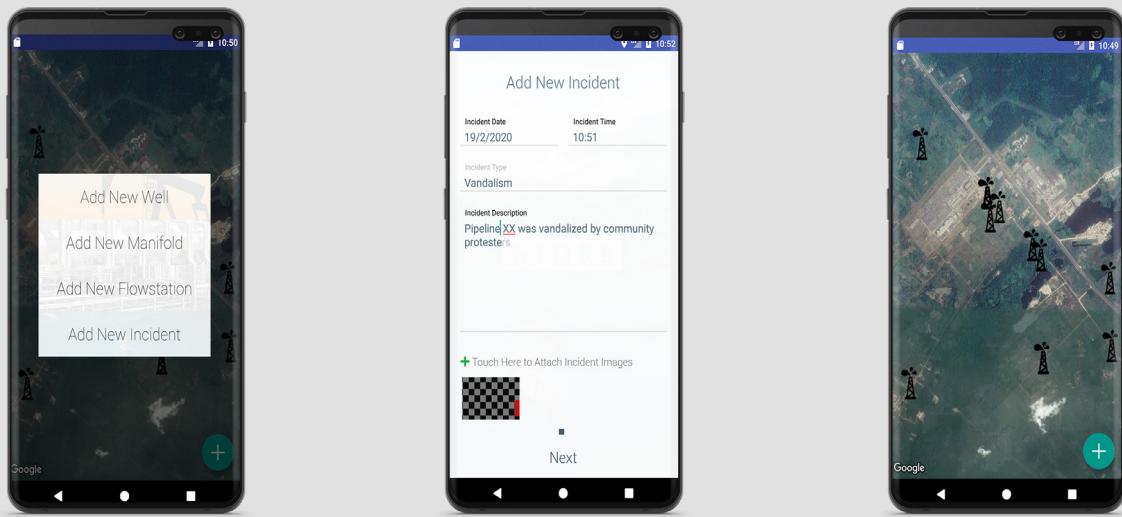
more cumbersome to use than Sieger's solution. Sieger's solution employed multi-threading to ensure that Monte-Carlo calculations ran much faster, and used Machine Vision to improve the accuracy and efficiency of contour map planimetry delineation leading to improved turn-around time for volumetric evaluations.

PE Workbench also handles Flowing and Static BHP estimation using pressure gradient data from BHP surveys, reservoir depth-area pair delineation from contour maps, and Monte Carlo based recovery factor estimation.





Incident Management System

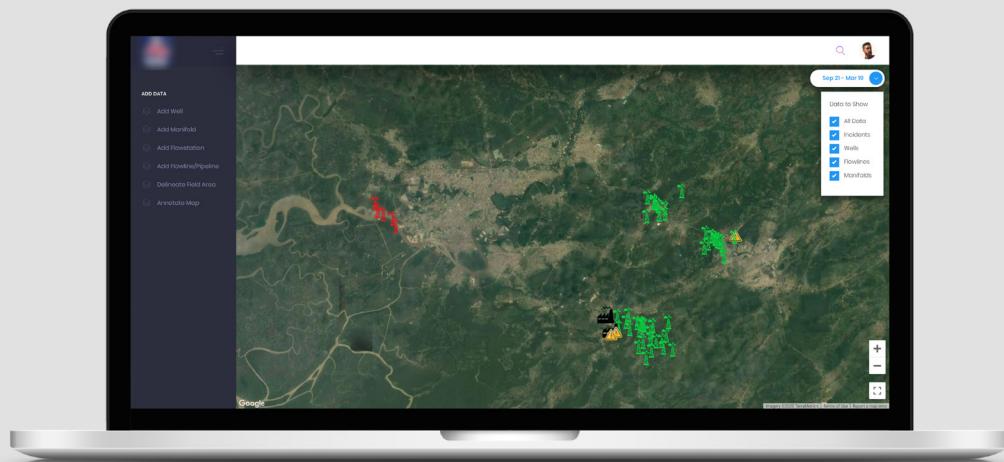


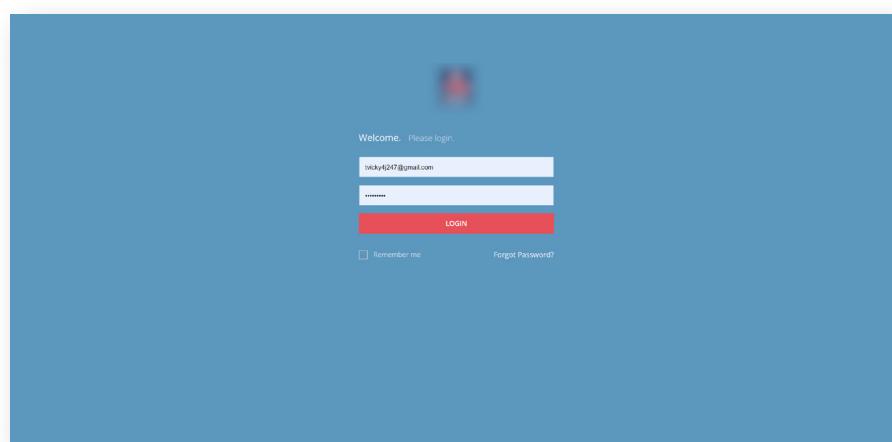
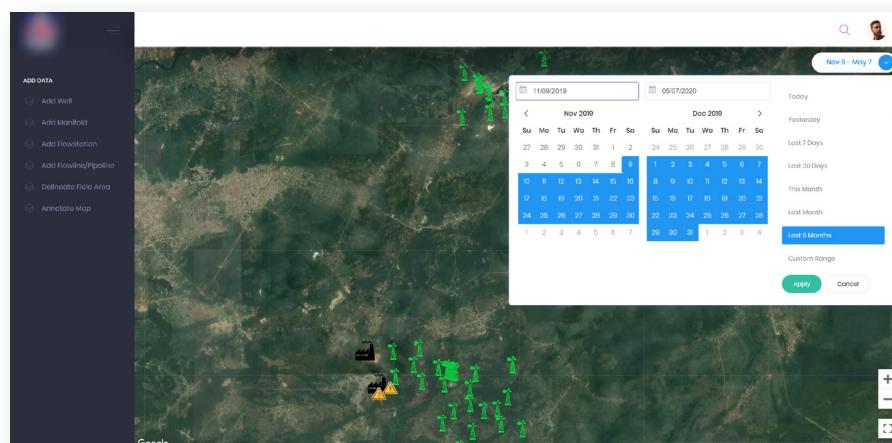
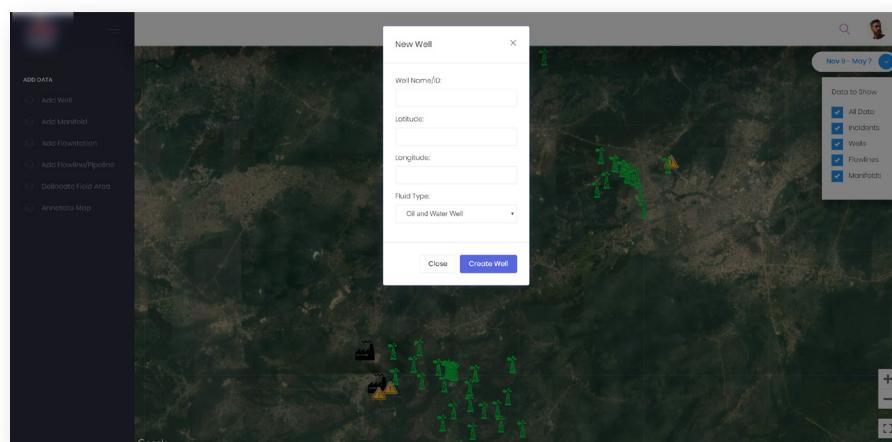
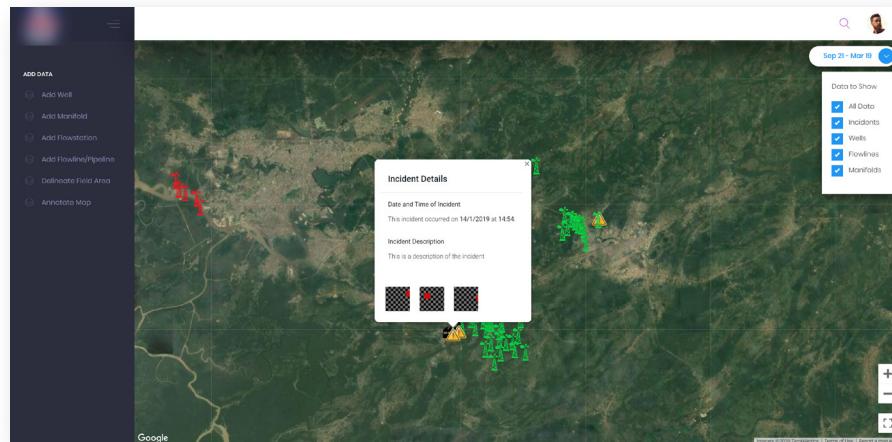
Sieger is currently creating a map-based incident management system which will enable visual tracking of incidents such as crude theft and asset vandalism for an energy company in Nigeria.

The system features a mobile app which allows field workers to document and report incidents (with photographic evidence) at any location within their operating area.

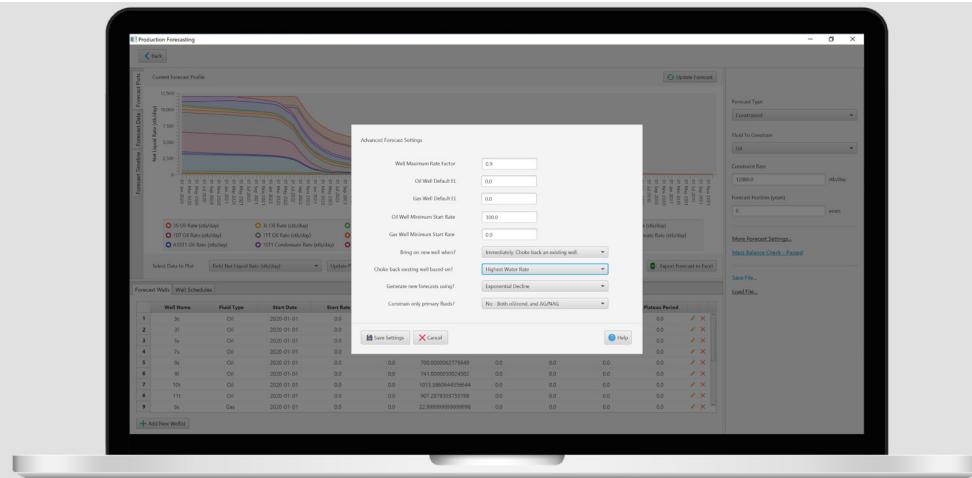
If an incident is marked by a field worker as having occurred at their location, the GPS location of the reporting device is captured and stored in addition to the incident data. Otherwise, the worker can specify a latitude and longitude of occurrence of the incident. All the provided incident data is then aggregated and displayed on a map for easy viewing by stakeholders and management.

This system will eventually be linked to drones which will intermittently surveil the area – triggered either by a timer, a human operator, or an unexpected loss of fluid pressure.





Production Forecasting Tool



Sieger has designed and developed a production forecasting tool which is currently being used by one of its client companies in Nigeria.

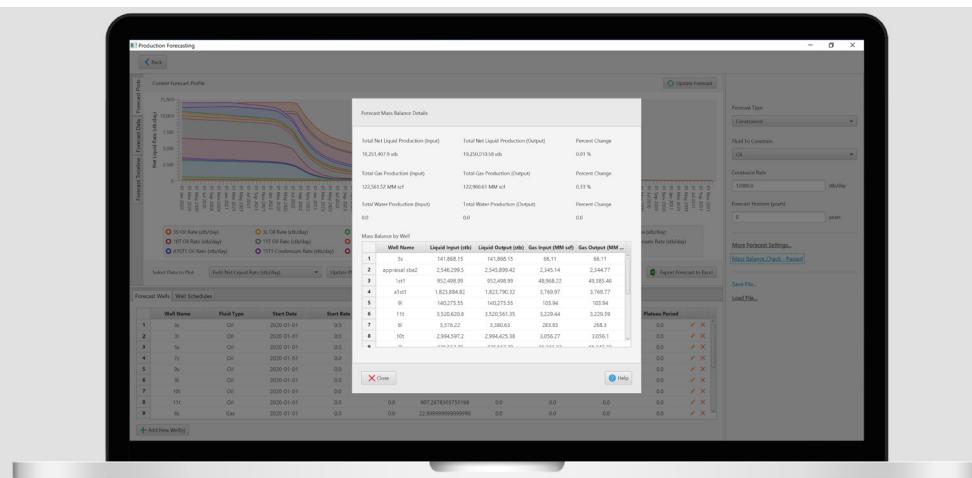
This tool allows the company's engineers to connect to their proprietary historical production database and import production history for multiple wells. This data can then be used to generate field wide production forecasts.

Several forecast generation methods are available including C-Curve, Logistic Growth, Arps DCA (Exponential, Hyperbolic and Harmonic) and Machine Learning. Externally generated forecasts can also be imported into the tool. Planned production wells on the drilling sequence can also be entered into the tool and

have forecasts generated for them based on a few input parameters.

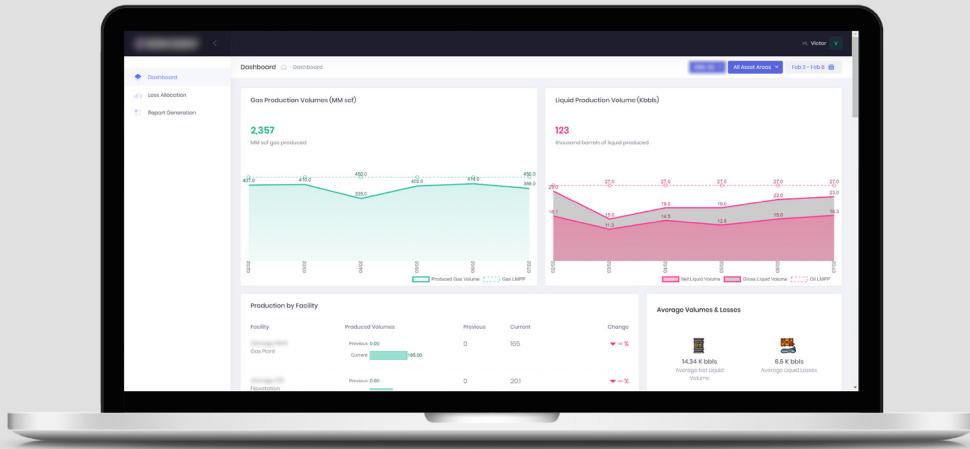
Production from individual wells can be beamed up or down as required by specifying start and end dates for the new rates. Field wide production can also be choked back in the same way. Permanent rate changes can also be input by not providing end dates. These forecasts can then be constrained due to export or commercial limits as required and exported for financial analysis.

The forecasts are also used to determine optimal drilling times for new wells, based on when production begins to decline below export/commercial constraints. Work is underway to add a financial analysis module to this tool to aid with development project economics.





Hydrocarbon Losses and Deferments Management System

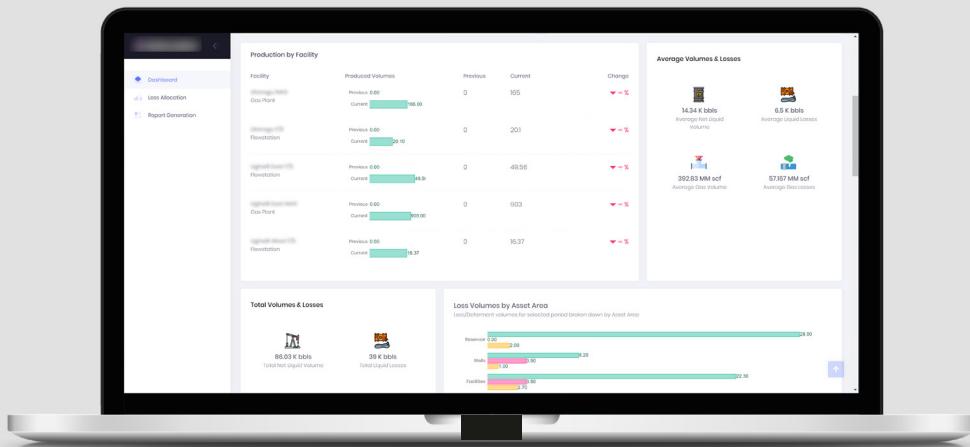


Sieger is currently building a system to track and report on production losses for an energy company. The previous system in use was excel based and was not searchable i.e. losses and deerrals from each month were housed in separate excel workbooks.

The system also did not lend itself to straightforward report generation since it was difficult to compare losses and production volume changes from month to month.

The new web based system developed by Sieger will enable both mobile and desktop-based data entry and provide interactive reports and dashboards to all stakeholders as required.

The system will integrate directly with the company's production volumes database, thus avoiding the duplication of data caused by the use of excel spreadsheets to track losses.



Open Loss Incidents

| Incident | Actual Volumes | BOE Volume | Days Open |
|---|----------------|------------|-----------|
| Gas - Reservoir - Reservoir - Reservoir | 10.1 | 4,363,333 | 4 |
| Gas - Reservoir - Reservoir - Reservoir | 0.5 | 3,203,333 | 3 |
| Gas - Reservoir - Reservoir - Reservoir | 0.2 | 3,203,333 | 3 |

Incident Occurrences

| Number of incidents | Closed incidents | Open incidents |
|---------------------|------------------|----------------|
| 7 | 5 | 2 |

Current Liquid MPP Volumes

Last MPP and LMP volumes liquid in the period selected.

| Category | Value |
|------------|-------|
| Reservoir | 10 |
| Sales | 80 |
| Facilities | 80 |
| Export | 80 |
| Commercial | 80 |

Current Gas MPP Volumes

Last MPP and LMP volumes for gas in the period selected.

| Category | Value |
|------------|-------|
| Reservoir | 400 |
| Sales | 900 |
| Facilities | 900 |
| Export | 500 |
| Commercial | 600 |

Asset Allocation

| ID | Asset Area | System Level 1 | System Level 2 | Equipment Level | Equipment Level 2 | Asset Type 1 | Asset Type 2 | Cause Level 1 | Cause Level 2 | Status | Actions |
|----|------------|----------------|----------------|-------------------------|-------------------|--------------|--------------|---------------|---------------|--------|---------|
| 0 | Facility | N/A | N/A | Choke | Choke | Actual | Unplanned | Reservoir | Facility | Open | ... |
| 1 | Facility | N/A | N/A | Commodity Board Columns | Level | Actual | Unplanned | Reservoir | Facility | Open | ... |

Showing 1 to 2 of 2 entries

1 Asset Area 2 Equipment 3 Causes 4 Volumes 5 Status

Please specify the Asset Area and System Levels

Asset Area *

Select...
Select the asset area

System Level 1 *

Select...
Select the system level

System Level 2 *

Select...
Select the system level

Next Step

Report Generation

Generate Loss Report.

Date *

Select...
Specify the date for the loss allocation.

Report Start Date *

20/04/2020
Specify the start date for the report.

Report End Date *

07/05/2020
Specify the end date for the report.

Allocated Losses Production Targets Production Volumes Annualized Production Volumes

Filter by Asset Area

Reservoir
 Sales
 Facility
 Export
 Commercial

Loss Allocation

CMR and Data for Allocation.

Data for Allocation *

07/05/2020
Specify the date for the loss allocation.

Out *

Select...
Specify the date for the loss allocation.

Open Losses Loaded

Open losses from the previous day have been loaded for allocation. You can now apply loss volumes to them as required. You may also close them if they have been resolved.

OK

BOE Loss by Asset Area

Total BOE Loss Volumes sum divided by Asset Area

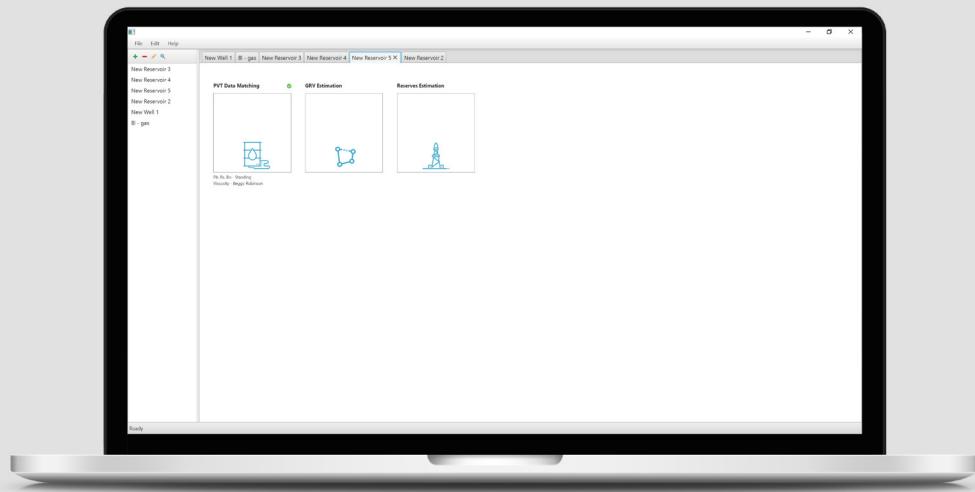
Loss Incidents by Asset Area

Total number of loss incidents in each Asset Area

Top 10 Loss Incidents

| Incident | Actual Volumes | BOE Volume | Cause | Status | Days Open |
|---|----------------|------------|--|--------|-----------|
| Gas - Reservoir - Reservoir - Reservoir | 29.00 | 6,058,667 | Price Volumes - Over estimation of Volumes | Closed | 1 |
| Gas - Reservoir - Reservoir - Reservoir | 10.00 | 4,363,333 | Electrical Failure - Facility Power | Open | 4 |
| Gas - Reservoir - Reservoir - Reservoir | 0.00 | 3,203,333 | Quantity - Missing Incisories | Open | 3 |
| Gas - Reservoir - Reservoir - Reservoir | 0.00 | 3,203,333 | Electrical Failure - Earth Induction Fault | Open | 2 |

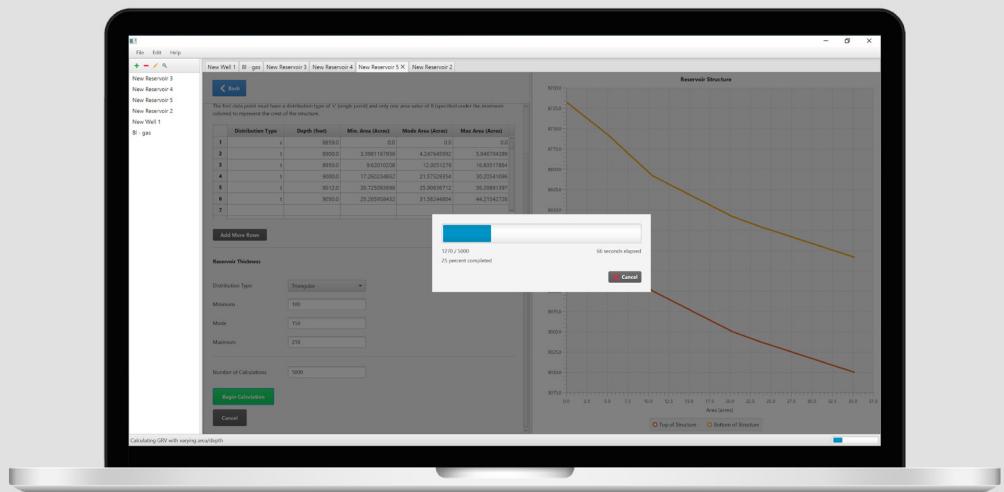
Reservoir Management Tool

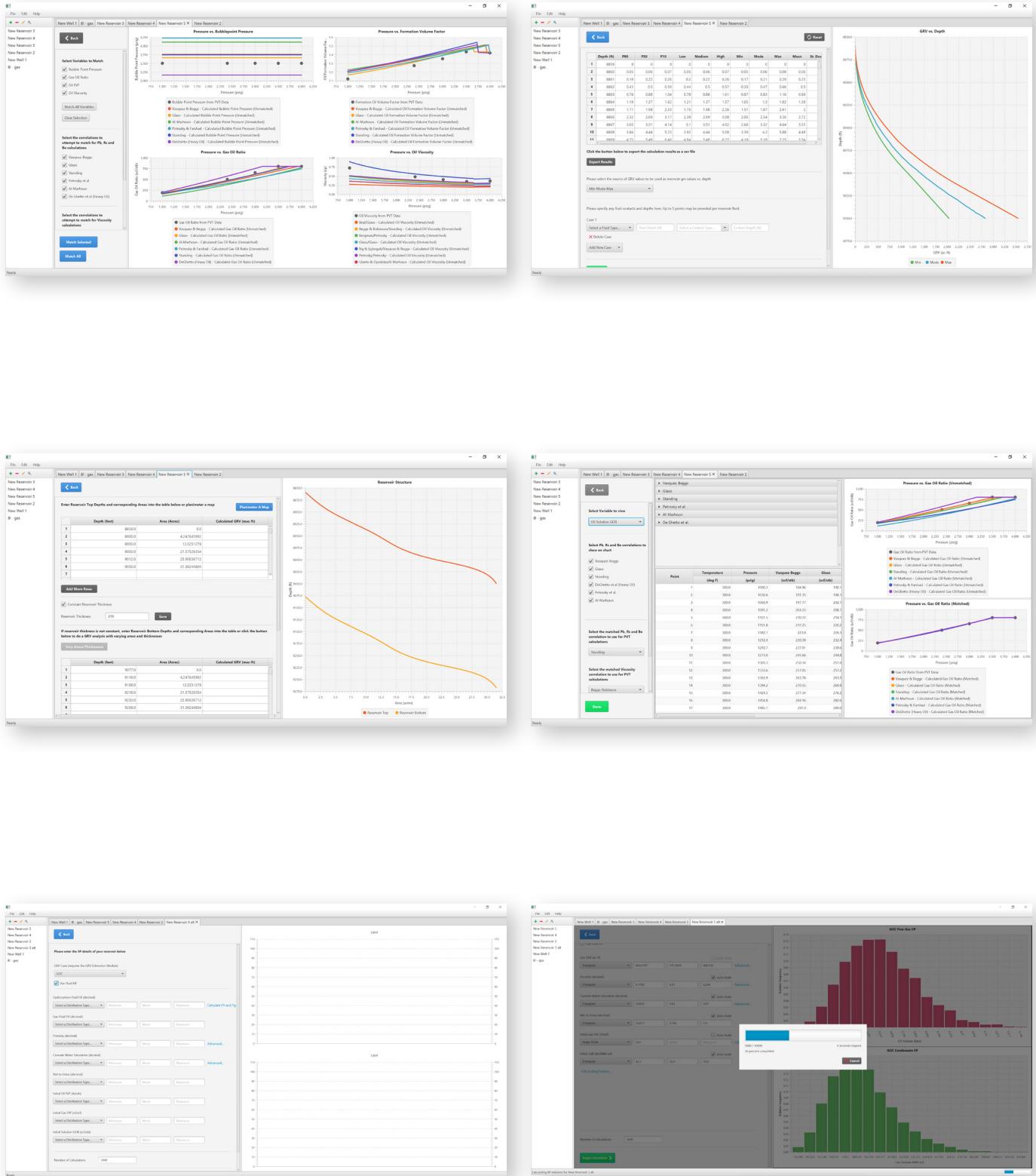


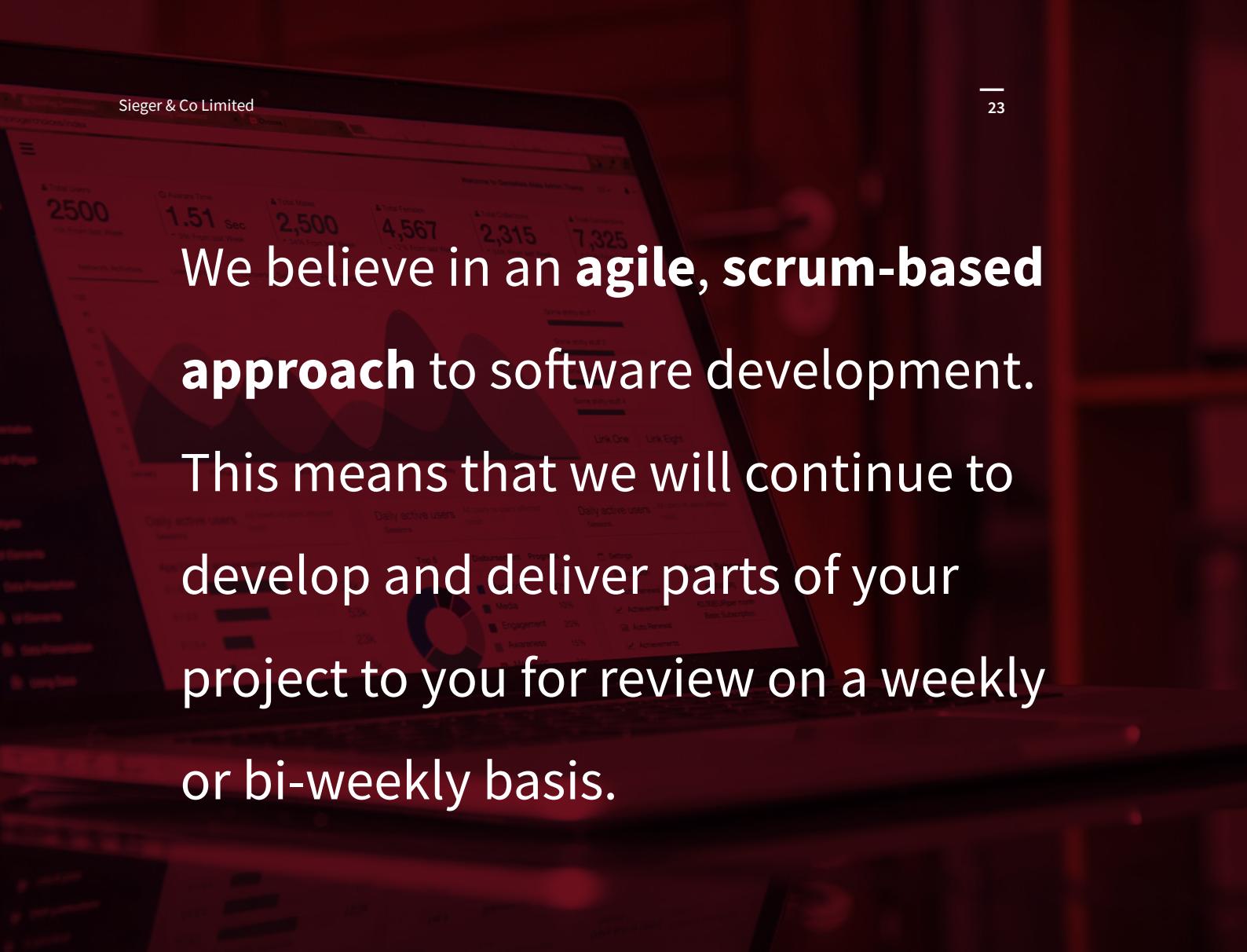
Sieger is currently developing a reservoir management tool to serve as its flagship software offering. This tool is being developed for both native and web-based variants.

The capabilities of this tool will include PVT Analysis and Estimation, Probabilistic and Deterministic GRV and Reserves estimation, Production Forecasting using Exponential, Harmonic and Hyperbolic DCA, C-Curve and/or Material Balance, field-wide production constraining for all reservoirs/wells based on export/sales considerations, economic analysis, et cetera.

This tool will enable reservoir engineers manage various disparate aspects of the operational life of a reservoir.







We believe in an **agile, scrum-based approach** to software development.

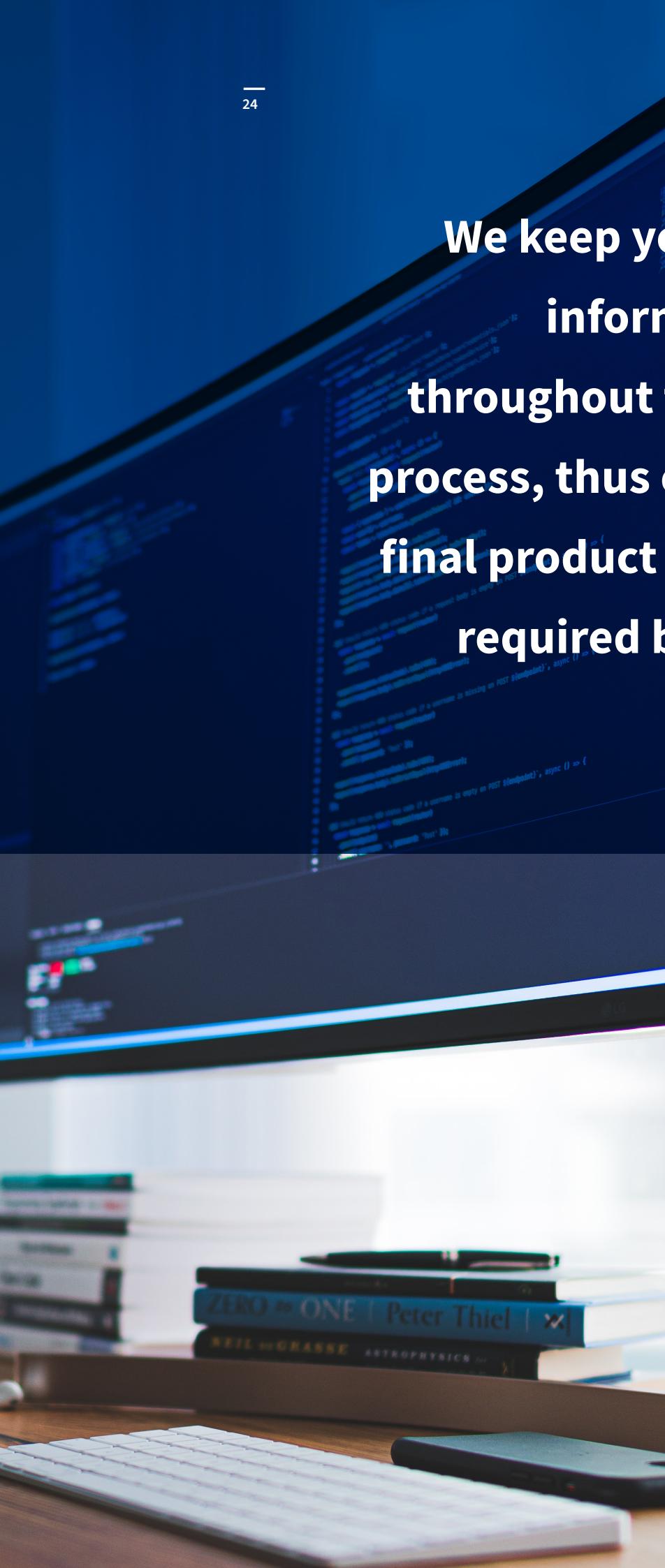
This means that we will continue to develop and deliver parts of your project to you for review on a weekly or bi-weekly basis.

In our experience, this approach to software development lends itself to collaboration between the project owner (your company) and the development team at Sieger.

It also ensures that we are always on the same page with our clients on everything from product design to functionality.

A typical project with Sieger begins with a requirements gathering session with members of our software development and engineering teams, and

stakeholders or project owners from your company. Once the requirements for the solution have been determined, we provide you with a timeline for execution, and let you know which computing frameworks, tools or service providers we intend to use to solve your unique challenge.



We keep you and your team informed and involved throughout the development process, thus ensuring that the final product is exactly what is required by your company.

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