

# Detect3D Fire and Gas Mapping

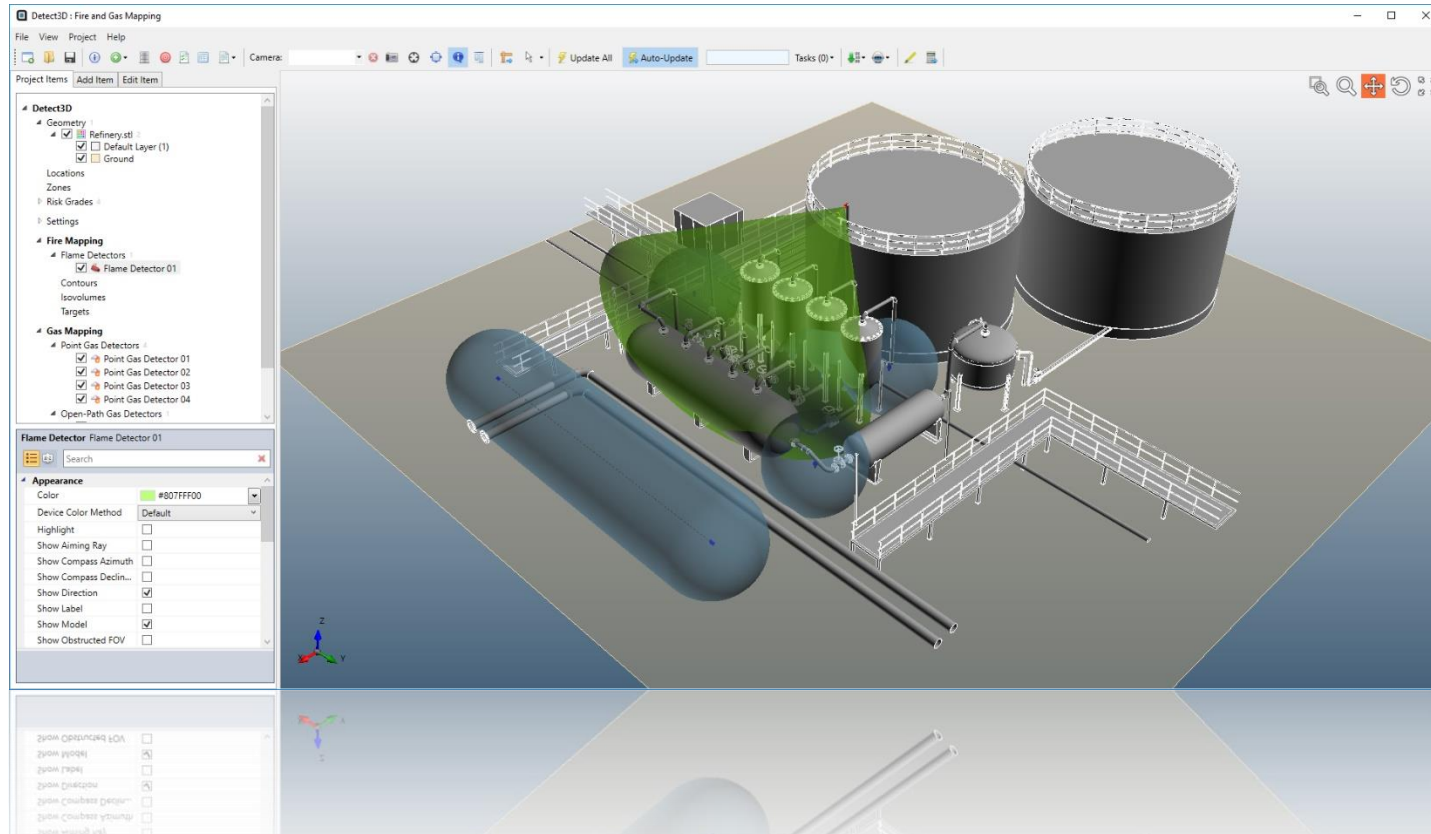
Developed by Insight Numerics

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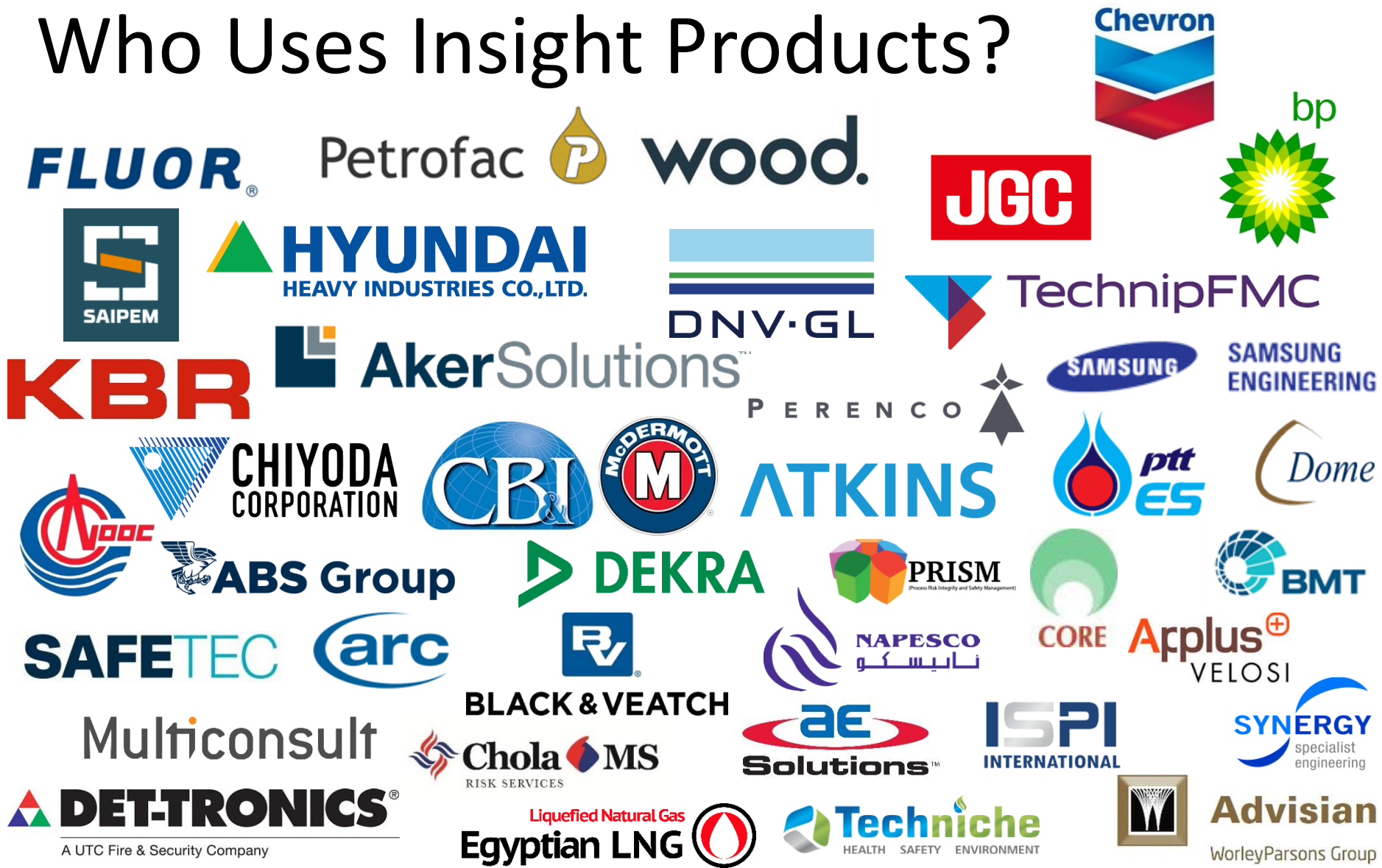
insightnumerics

# Introduction to Detect3D

- Detect3D is a modern, Windows-based software product for Fire and Gas (F&G) Mapping analysis.

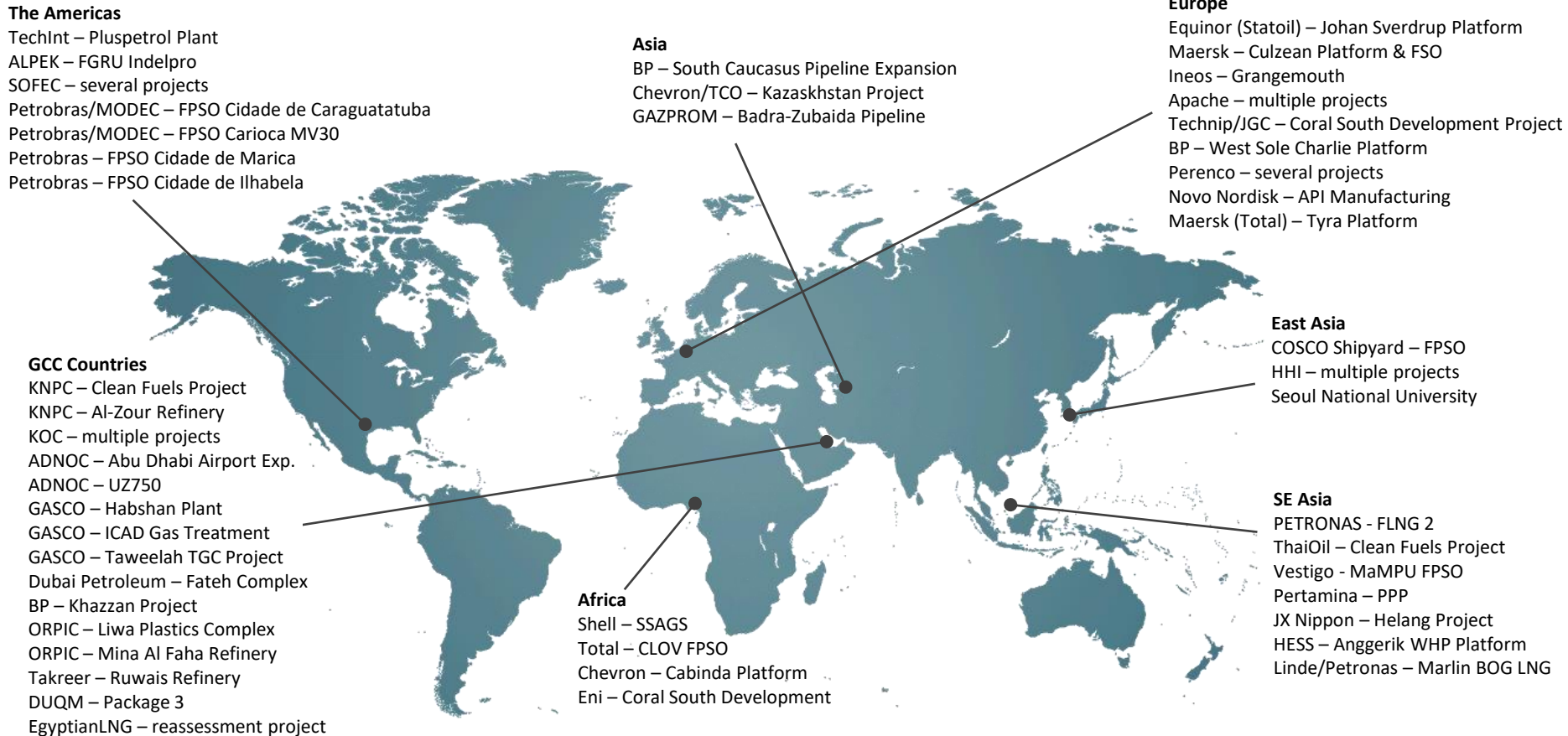


# Who Uses Insight Products?



# Where is Insight Numerics used?

- Our software has been used on projects worldwide for BP, Shell, Chevron, Petronas, ADNOC, Petrobras, Maersk and many more.

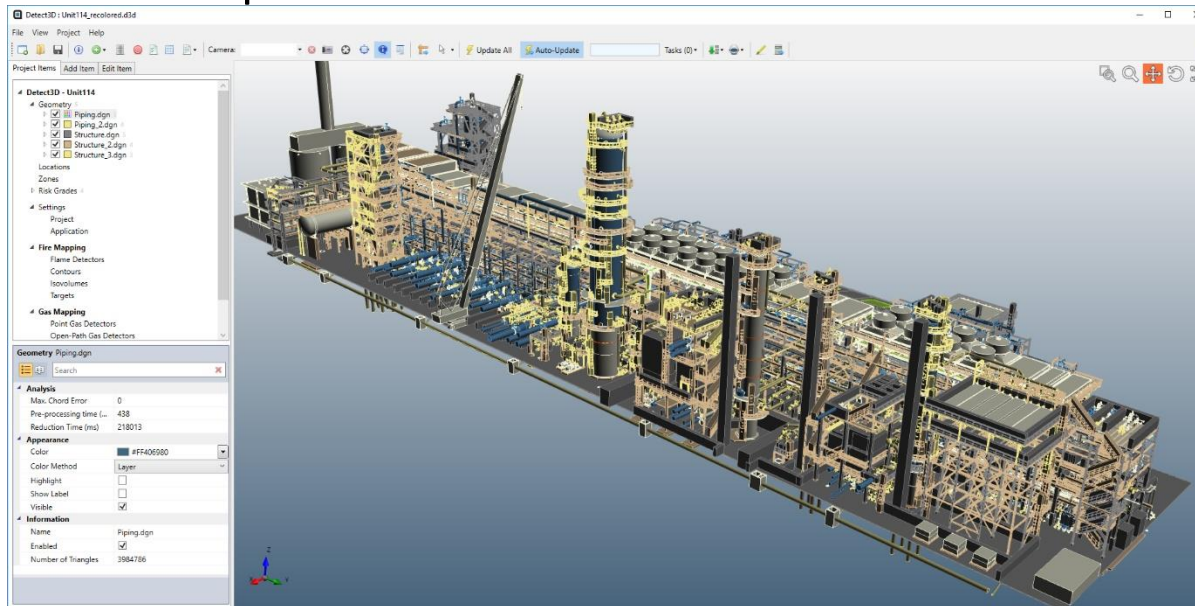


# Why use Detect3D?

- Detect3D is used by engineering firms worldwide for F&G mapping projects for the following reasons:
  - Using Detect3D in-house saves up to 70% in time and cost for F&G mapping projects.
  - Turn-around time for design changes is reduced from 6+ weeks to less than one week.
  - Fully integrated with project CAD files (PDMS, SP3D, DGN, DWG).
  - The accuracy of Detect3D is unmatched, and it is the only F&G mapping software to be validated.
  - Accepted for BP, Shell and many other projects and performance standards.
- Many specialist consultancies provide Detect3D services for local support.

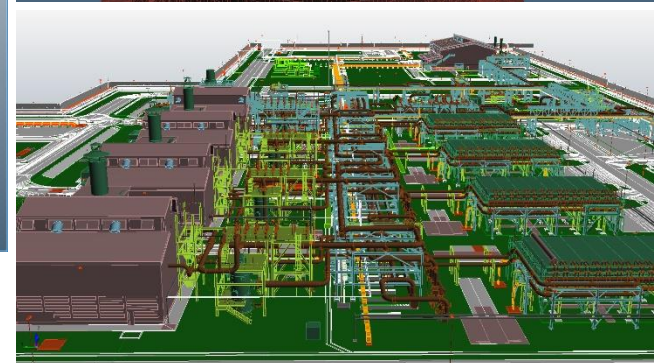
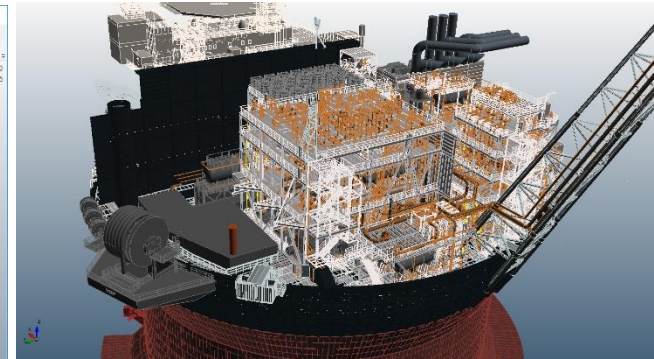
# CAD Integration

- Via the DGN file import, Detect3D can load **PDMS** and **SmartPlant3D** CAD models. **Navisworks (NWD)** files can be imported via DWF files. AutoCAD DWG, DXF and other standard CAD formats (STEP, IGES, OBJ and STL) are also accepted.



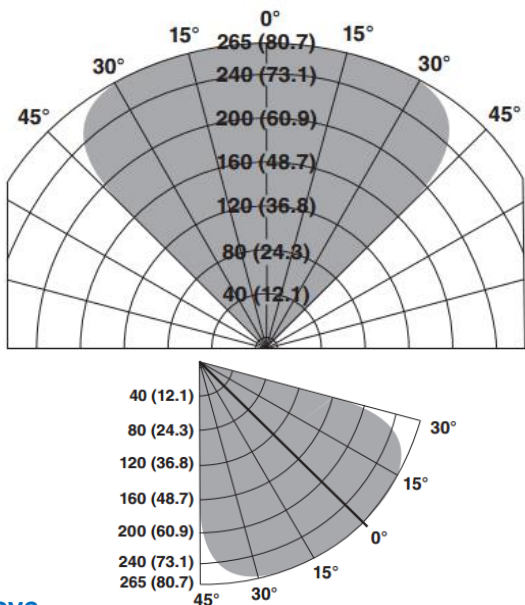
Above  
Right

Screenshot of Detect3D showing a typical CAD file for an onshore site.  
Further examples of CAD used in Detect3D for 3D F&G Mapping projects.

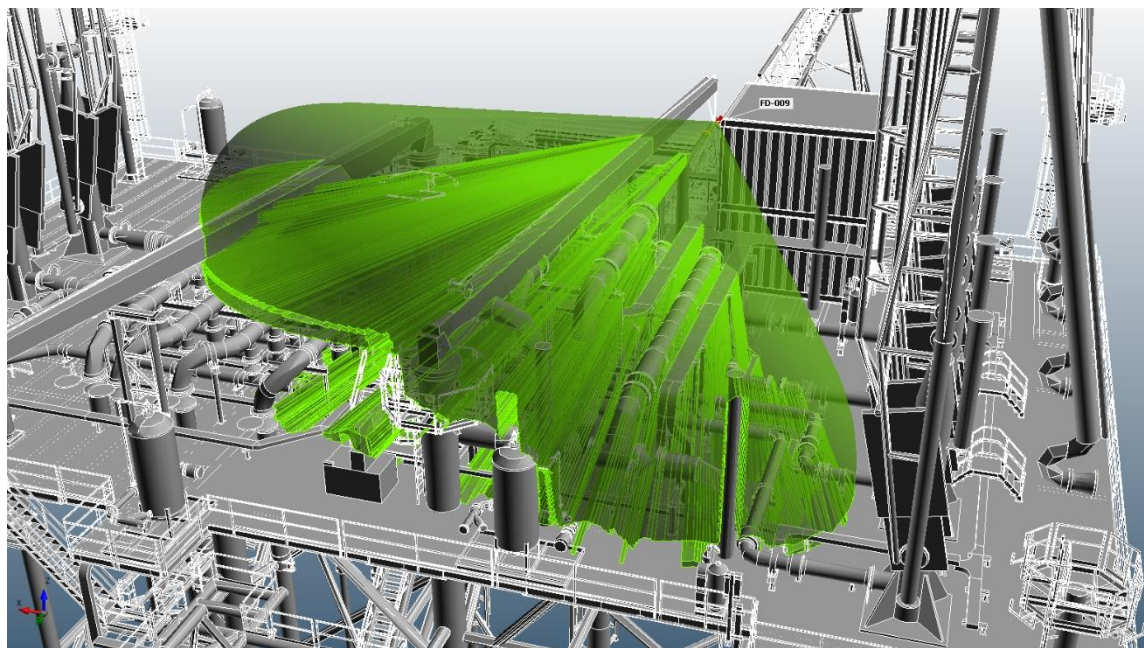


# Flame Detector Field-Of-View

- Each detector FOV is calculated by casting 100,000+ rays into the geometry. The resulting “obstructed” FOV is highly accurate.
- Detect3D can be used with all manufacturers and models.



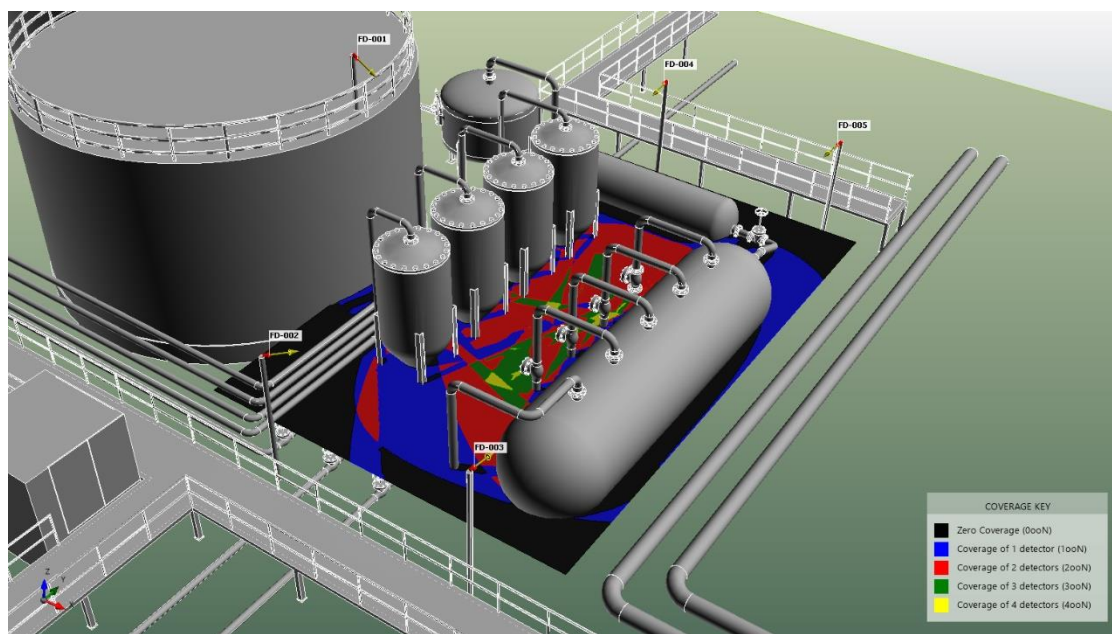
**Above**  
Manufacturer's data for a flame detector FOV



**Right**  
An obstructed FOV (green) calculated by Detect3D

# Coverage Calculation

- The coverage is calculated by combining multiple detector FOVs in a volume. The resulting 100N, 200N are calculated on a *volumetric* basis.
- Coverage is reported on tables (exportable to Excel) contours, and isovolumes.



Show results by: Risk Grade

Flame Detector Coverage

Fire Zone	Zero (0ooN)	1 or more ( $\geq 1ooN$ )	2 or more ( $\geq 2ooN$ )	3 or more ( $\geq 3ooN$ )
<b>3D Zone Volume</b>	<b>23.1 %</b>	<b>76.9 %</b>	<b>33.7 %</b>	<b>9.9 %</b>
Grade A	24.1 %	75.9 %	32.4 %	9.3 %
Grade B	23.1 %	76.9 %	33.7 %	9.9 %
Grade C	100 %	0 %	0 %	0 %
<b>Zone 02</b>	<b>28.2 %</b>	<b>71.8 %</b>	<b>33.5 %</b>	<b>7.3 %</b>
Grade A	100 %	0 %	0 %	0 %
Grade B	100 %	0 %	0 %	0 %
Grade C	100 %	0 %	0 %	0 %

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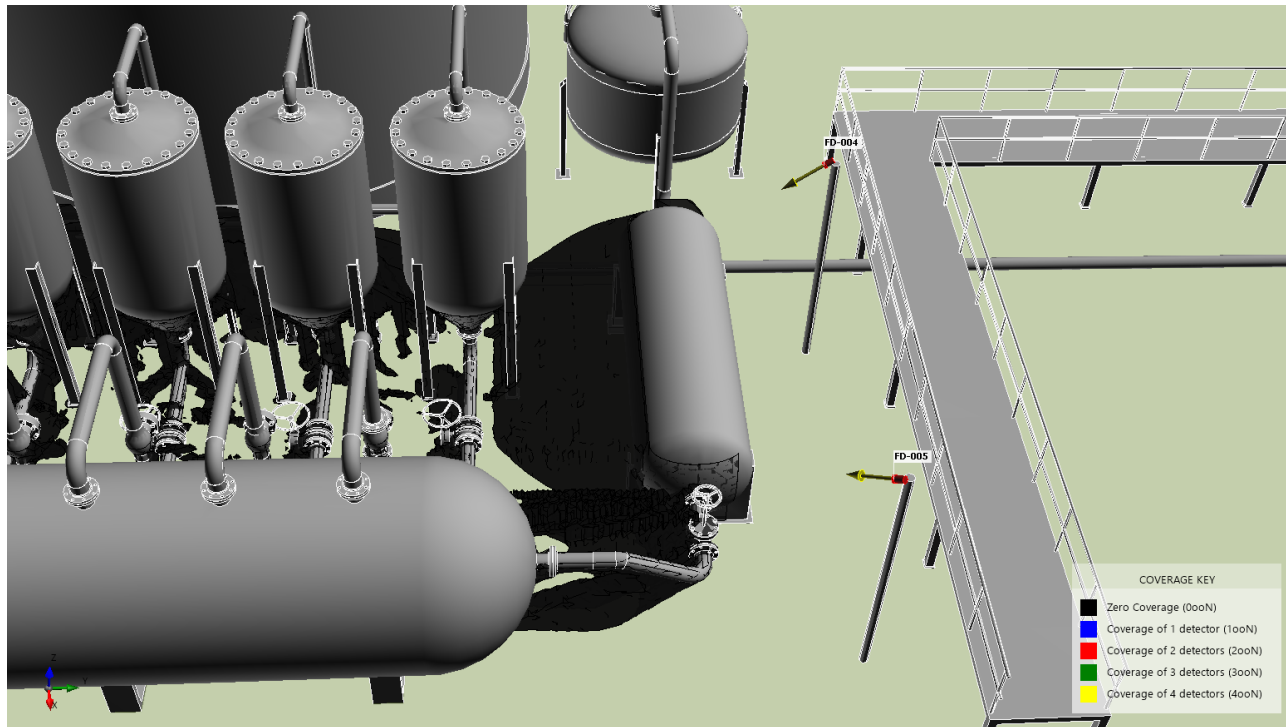
Coverage contour at 2 meters above ground level.

## Above

Coverage table, exportable to MS Excel.

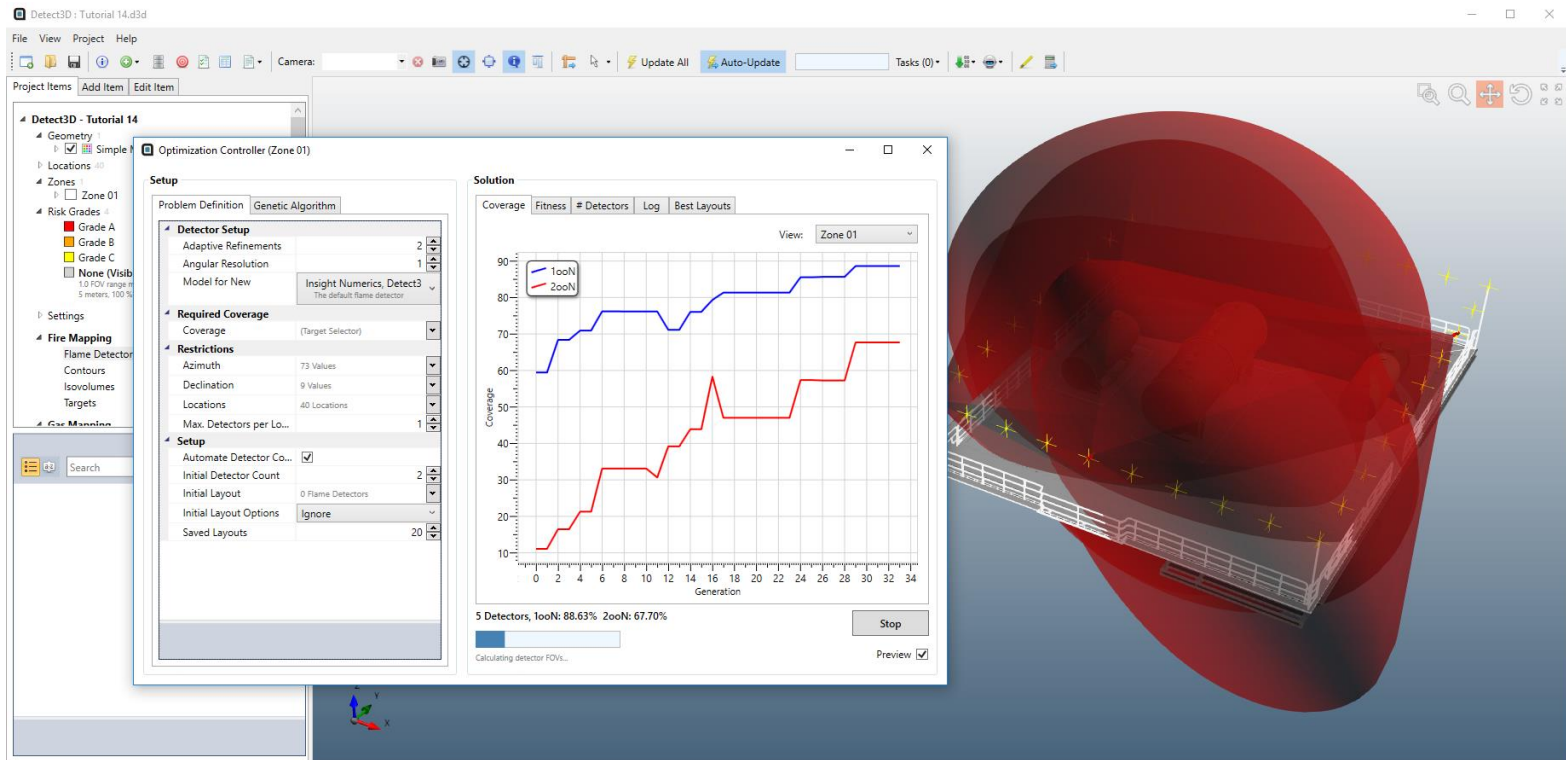
# Coverage Isovolumes

- Three-dimensional surfaces (isovolumes) are also shown. These are particularly useful to highlight “blind spots” or zero-coverage areas.
- The layout can be improved manually, using the “detector ranking” tool, or using optimization.



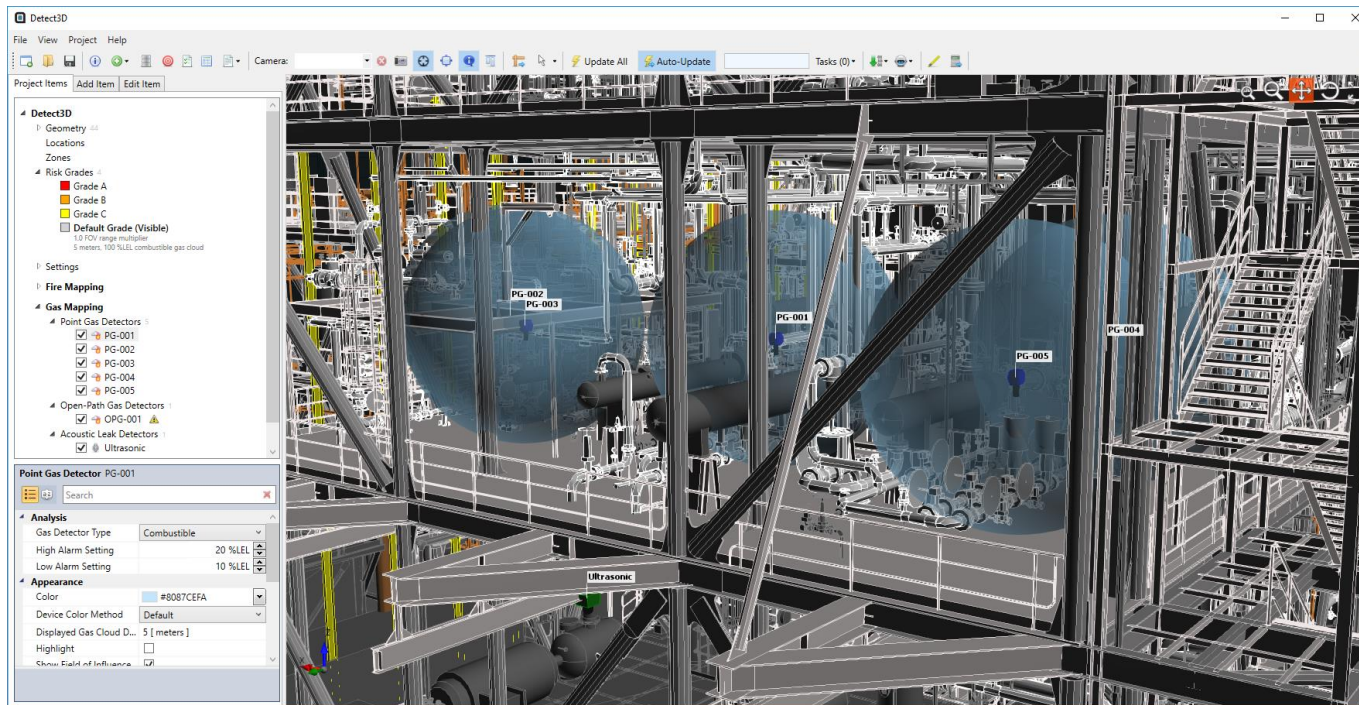
# Optimization

- Detect3D can optimize flame detector layouts so that the minimum number of detectors are specified for a target coverage criteria.
- The optimization uses Genetic Algorithms to “evolve” optimal layouts.



# Gas Mapping

- The coverage of gas detector layouts is calculated based on the “design gas cloud” approach popularized by the UK HSE, BP and Shell.
- Point and open path gas detectors can be added to the simulation. Coverage can be visualized using contours and isovolumes.



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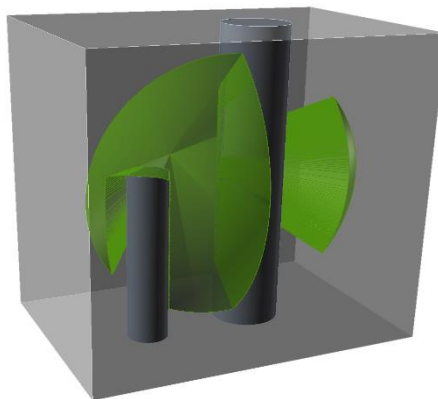
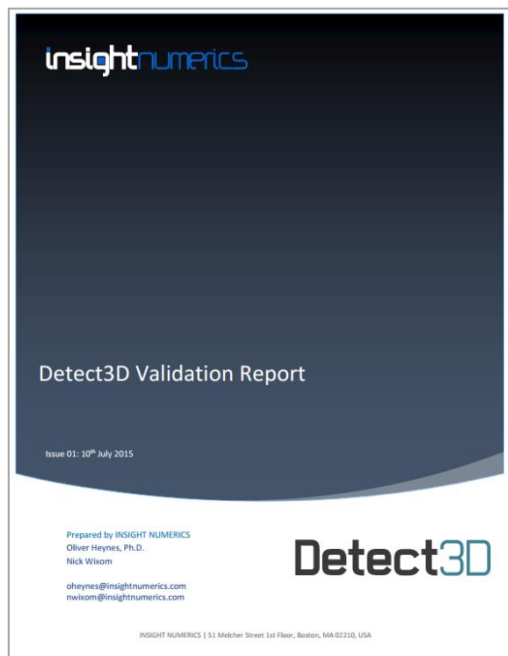
Point gas detectors highlighted on an offshore platform. The blue spheres indicate the “field of influence” of the detector, depending on the gas cloud size required for the coverage assessment.

Multiple gas cloud sizes can be used for the gas mapping evaluation.

Detect3D can share data with Insight Numerics’ CFD software, in:Flux to perform scenario gas mapping analysis.

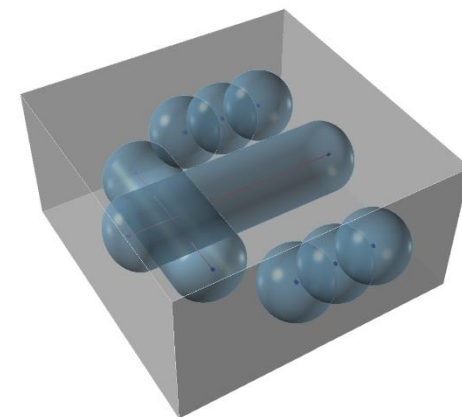
# Validation

- Detect3D is the only validated Fire and Gas Mapping software on the market.
- Insight Numerics published the validation, including the raw data set, on the website as a show of commitment to transparency.



**Left**

The Detect3D validation report, available on [insightnumerics.com](http://insightnumerics.com).



**Above**

Images from the validation report.

# Viewing Mode

- “Viewing Mode” is one of the most popular and valuable features of Detect3D.
- It allows Detect3D project files to be loaded into the software for viewing *without requiring a license*.
- This provides maximum clarity and transparency both within organizations, and between clients and contractors.
- Deliverables from Detect3D projects often include the report *and* the project files so they can be viewed at a later date.

# Next Steps...

- Detect3D can be downloaded by registering on [www.insightnumerics.com](http://www.insightnumerics.com)
- Upon registration, a free 10-day evaluation license will be emailed automatically.
- The evaluation includes 14 tutorials, CAD files, and a user guide to help you get started.
- [Our YouTube Channel](#) contains several videos about Detect3D
- For questions about Detect3D or licensing options, please email [info@insightnumerics.com](mailto:info@insightnumerics.com)