

Storage tank Engineering



Oil & Gas - Renewable Energy - Electrical Energy



PYTHEAS
Engineering Group

Our services

STORAGE TANKS ENGINEERING FOR PROJECT MANAGEMENT ASSISTANCE (PROJECT / SHUT DOWN PHASES)

We support our clients on:

- ❖ The maintenance of their assets in operational condition
- ❖ The implementation of inspection and maintenance plans
- ❖ The productivity plans
- ❖ The supervision and coordination of work
- ❖ The assistance in the implementation of regulatory controls
(Study of soil, floor-scans, non-destructive tests and hydraulic tests)
- ❖ The feasibility studies for new tanks;
- ❖ Process optimization;
- ❖ The Management and estimation of costs
- ❖ The organization: reserving/purchasing materials
- ❖ The integration of projects (modernization and new works)
- ❖ The current and developing codes and regulations



WORK PREPARATION

- ❖ Realization of an operational range and master planning (provision, transfer, cleaning, internal inspection after cleaning, boiler making work, piping, civil engineering and instrumentation)
- ❖ Realization of plans from the 3D scan via the SOLIDWORKS or AUTOCAD software for the prefabrication of elements such as ferule, border plate, structure, gateway. This technology allows to produce reservoir elements while in service (lack of plans, deformation of a non-critical reservoir etc.)
- ❖ Realization of the technical specifications of work (boiler making, piping, civil engineering and instrumentation)
- ❖ Planning work and interventions of different trades
- ❖ Preparation and animation of risk analysis and/or prevention plans
- ❖ Logistical preparation (closed site, based life and waste management)
- ❖ Cost control (upstream « existing price schedules », follow-up and downstream)

BAC_MADTFL		
BAC A TOIT FLOTTANT		
N° op.	Désignation opération	Action par
100	Travaux préalables pour MàD	
110	Génie civil : accès cuvette	RPRATK
120	Tuyauteries définitives pour MàD : préfab. et montage	RPRATK
130	Mise en position travaux des béquilles	RPRATK
140	Dépose de passerelles	RPRATK
150	Pose échafaudage	RPRATK
160	Décalorifugeage	RPRATK
170	Graphitage TF	RPRATK
180	Mise en place extracteur d'air	RPRATK
190	Branchement extracteur d'air et éclairages	RPRATK

SUPERVISION AND COORDINATION OF WORK

- ❖ Follow-up of the maintenance and repair plan
- ❖ Supervision of the work in accordance with the master plan and the codes in force
- ❖ Coordination of the interventions of the different trades (management of the phases of intervention and optimization of the planning)
- ❖ Organization and supervision of safety and security on the worksites
- ❖ Monitoring and reporting
- ❖ Cost control follow-up
- ❖ Follow-up of the quality plan
- ❖ Follow-up of regulatory documents and files



INSPECTION

- ❖ Regulatory inspection (according to EEMUA 159, API 653,579, codres div.2, recognized internal procedure)
- ❖ Inspection of operational tanks (according to EEMUA 159, API 653, codres div.2, recognized internal procedure)
- ❖ Compliance inspection
- ❖ Hydrostatic test reports
- ❖ 3D geometric control with gateway to AUTOCAD and/ or SOLIWORKS software (differential settlement, plumb, bottom profile, roundness, verticality and flatness)
- ❖ Frangibility (NF EN 14015 et ISO)
- ❖ Ventilation / air vents (NF EN ISO 28300)
- ❖ Tank calculations such as constructed
- ❖ Specific expertise



RBI METHOD (Risk-Based Inspection)

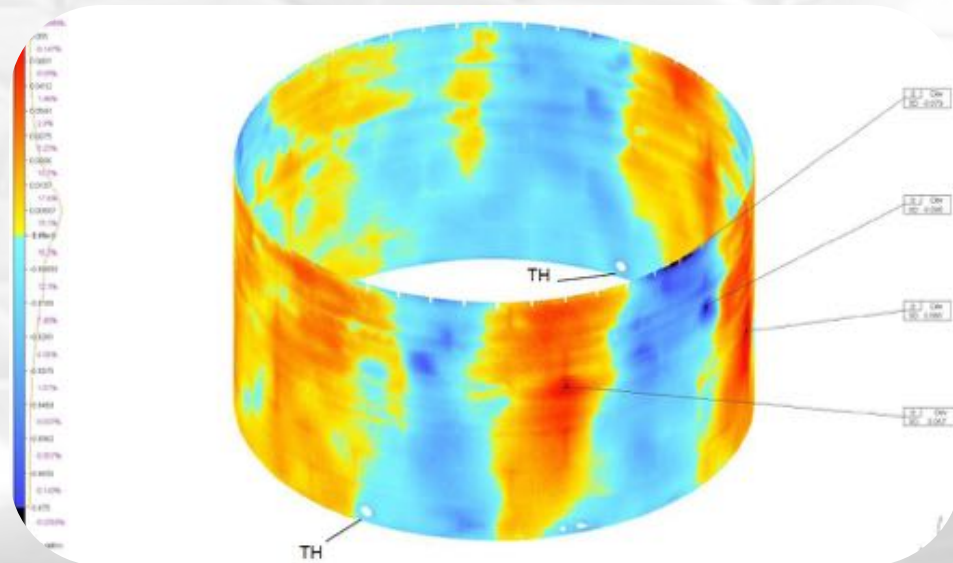
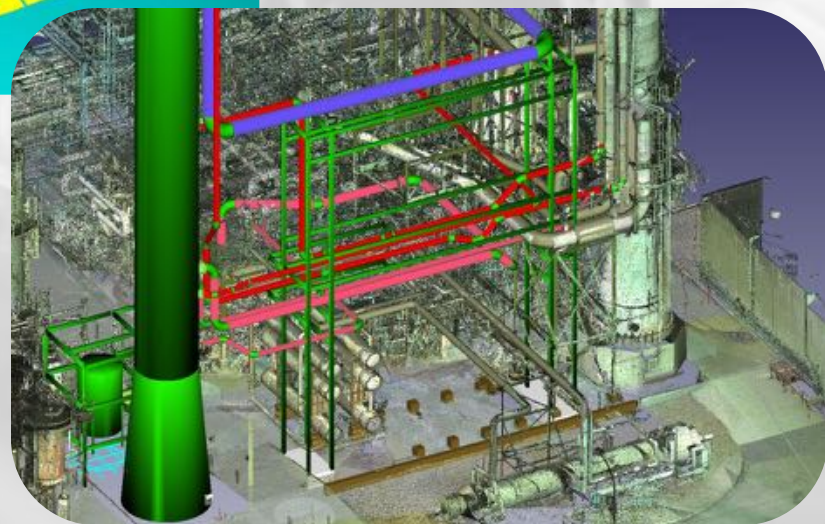
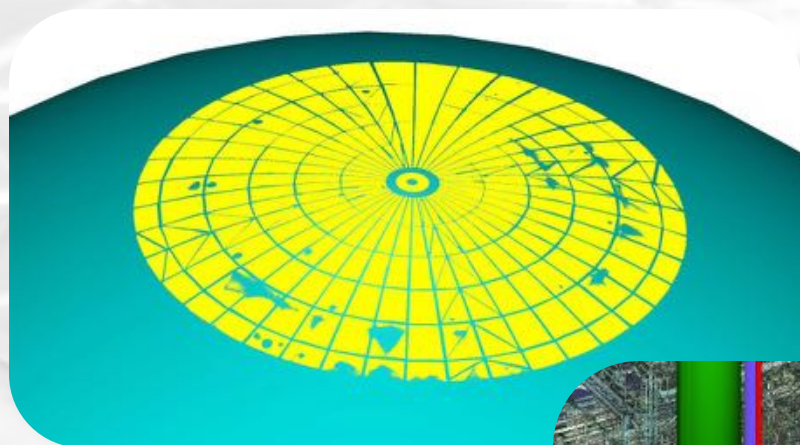
- ❖ Implementation of an inspection plan based on the tank farm, mode of operation and maintenance strategy
- ❖ Documentation update (status 0 and descriptions)
- ❖ RBI strategy update
- ❖ Implementation of an RBI inspection procedure based on the tank farm, mode of operation and inspection strategy
- ❖ Implementation of RBI software solutions
- ❖ Realization of schedules and overall inspection plans according to the actual failure modes
- ❖ Audit of the existing RBI system

		Haute	B
		Moyenne	B
Probabilité		Basse	N
		Négligeable	N



Inspection control - TQC

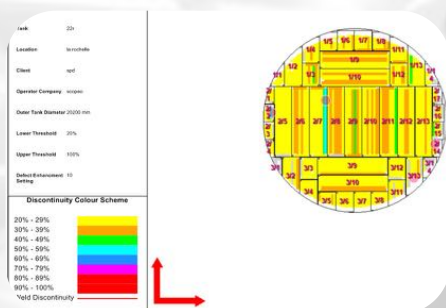
3D Geometric survey



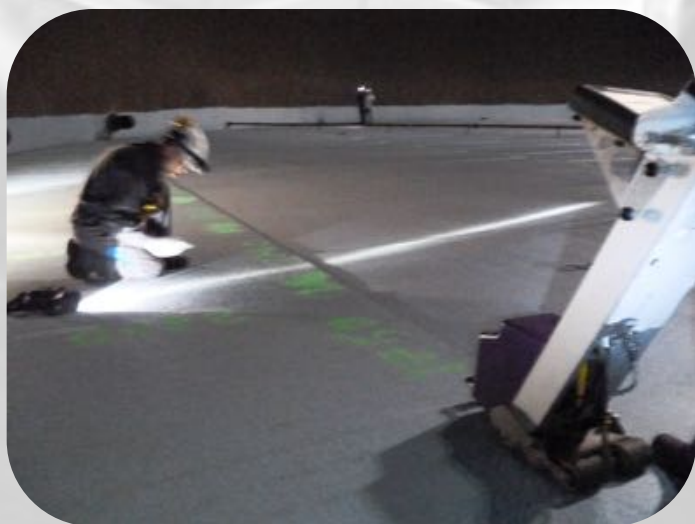


Inspection control

Magnetic Techniques



Floor map



ACFM



Ultrasound Crawler

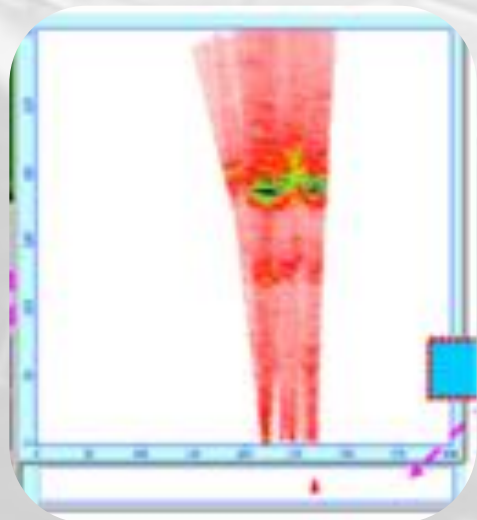


Inspection control

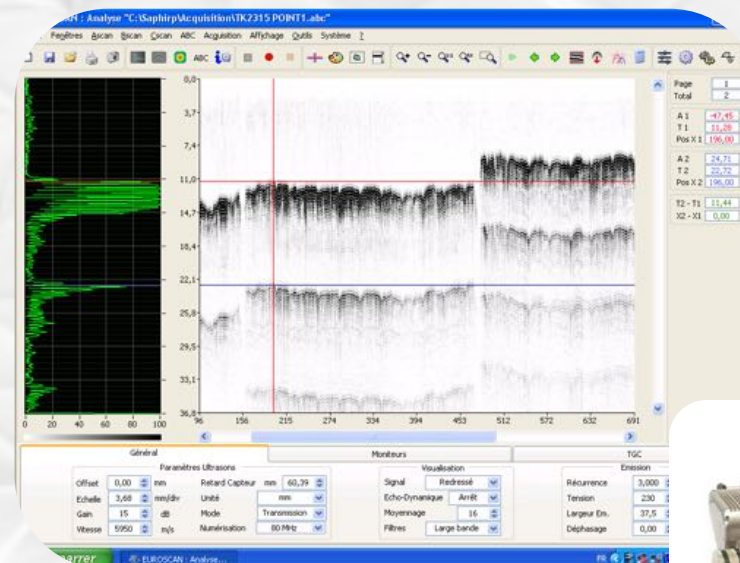
Ultrasonic Techniques



Guided waves



Thickness measurements

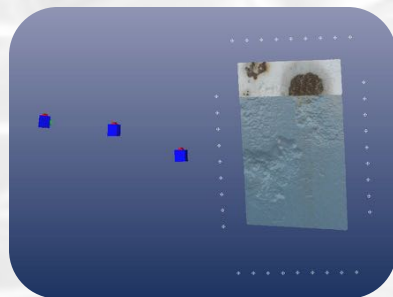


Ultrasound Crawler scan B

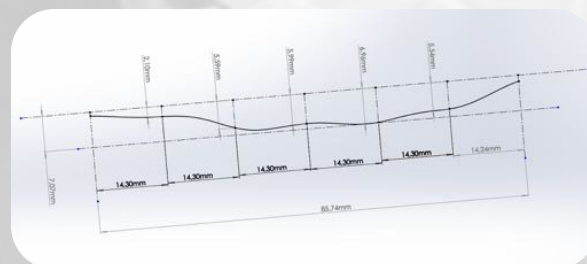
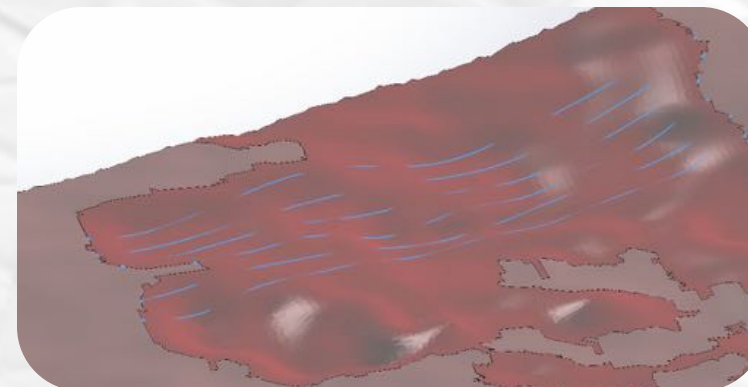




Inspection control



Photogrammetry



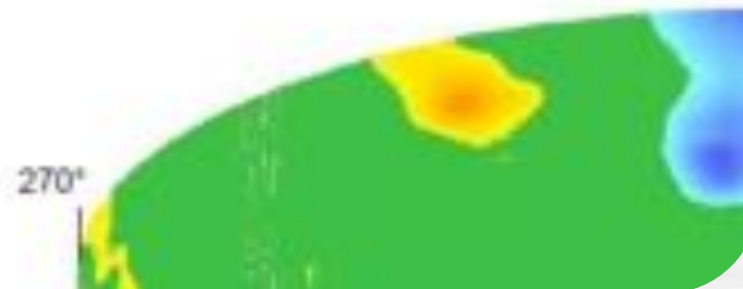
Canker survey following API 653

New tank quality monitoring



Welding control

CODRES 2007 F2.7.4: tolérance = 50mm

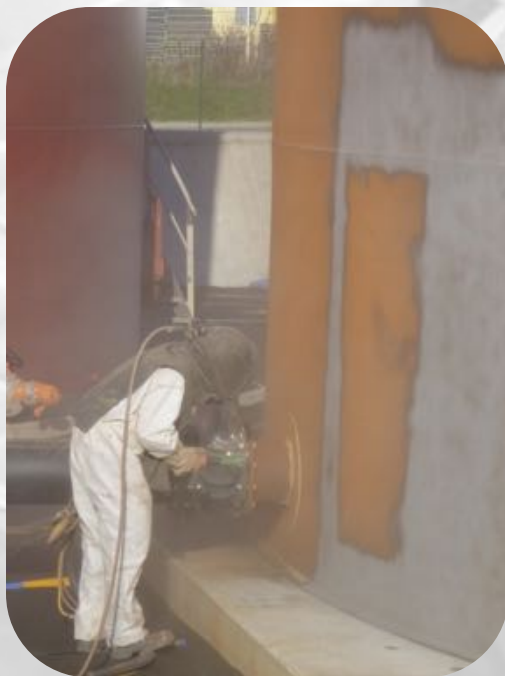


Geometric control



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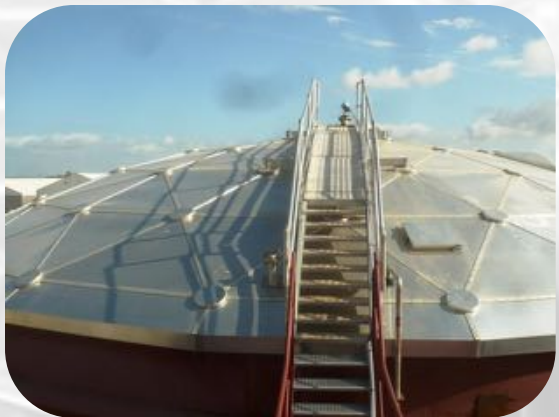
Coating Expertise





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Rehabilitation / change of assignment



Rehabilitation / change of assignment

Implementation of riveted tank liner





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Rehabilitation / change of assignment

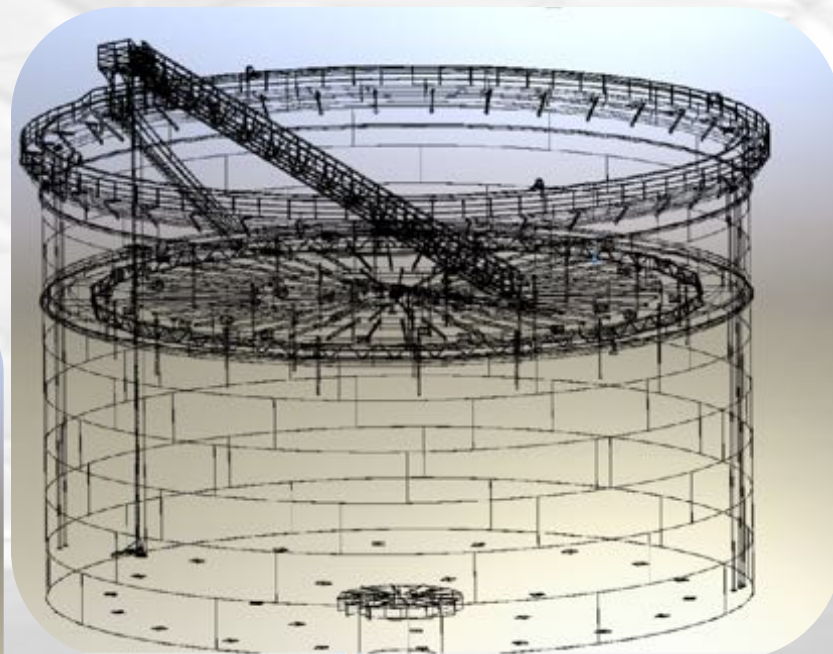
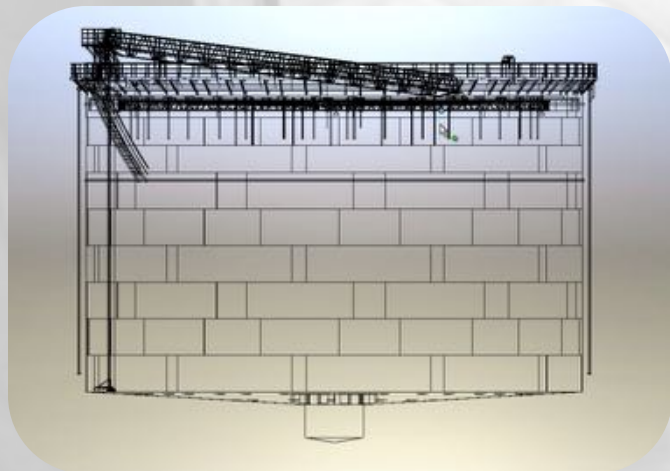
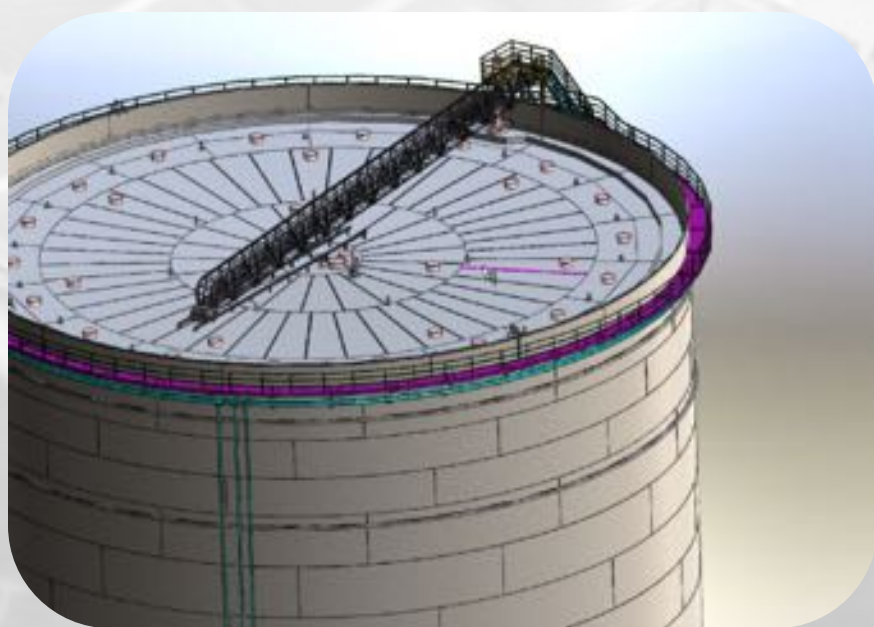
Implementation of an aluminium dome





Rehabilitation / change of assignment

Modification of fixed roof in a floating roof



Rehabilitation / change of assignment

Tank lifting work



Rehabilitation / change of assignment

Implementation of insert



Training in preventative and curative maintenance of storage tanks (French / English)

- ◆ **Module 1** : Introduction to storage tanks (how are they assembled and maintained...)
- ◆ **Module 2** : Preventative and curative maintenance
- ◆ **Module 3** : Codes and their applications (Codres, API, EEMUA....)
- ◆ **Module 4** : Technical follow-up (Contractual documents)
- ◆ **Module 5** : Routine inspection

In
development

They trust us:



Schlumberger



ExxonMobil



Our past and upcoming industrial projects (short-term)

- ✦ Inspection of a storage tank farm according to DT92 (PM2I), inspection of the civil work inherent to the storage tanks (foundation and tank basin)
- ✦ Technical advocacy during revamping in Africa (Tanzania, Benin and the Ivory Coast)
- ✦ Inspection of piping supports for the tank farm
- ✦ Geometric control by 3D scanning in Ivory Coast and other countries
- ✦ Revamping of two storage tanks in RCA (Central African Republic) and construction of a new tank

Our contacts :



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