



Oil & Gas

Life Sciences

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Oil & Gas

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Who we are



GST is a Rome-based engineering firm that specialises in international industrial projects. We use our knowledge and experience of *Industrial Processes* – in the fields of *Oil Refining, Pharmaceuticals, Renewable Energy, Aerospace*, etc. – to develop the range of skills and capabilities that enable us to provide high-quality services, in relation to the various plant design phases and disciplines. Building up on our **Chemical Process Design** expertise, we can now meet the all-round needs of our Customers delivering *Consulting, Engineering, Procurement* support and *Construction* and *Commissioning* supervision services, as well as complete *Turnkey* solutions for small-scale plants or plant units.

This brochure illustrates the activities we carry out and the services we provide in the **Oil&Gas** Sector. For more information please visit our website at www.gstengineering.it and email us at info@gstengineering.it.

What we do

The **Oil&Gas Sector** in which we operate (*references*) and in which we have built up our expertise (*competencies*), the **Disciplines** we master and the range of **Services** we provide.

The Oil&Gas Sector

The **Oil&Gas** sector covers all activities related to both liquid and gas hydrocarbons, ranging from prospecting, drilling, extraction and refining to distribution. GST delivers a broad range of Services covering every phase in the implementation of an Oil&Gas plant whether it's the **Construction of a New Plant** (*Grassroot*) or the **Upgrading of an Existing Plant** (*Revamping*). GST engages in the most widespread **Contract** arrangements (e.g.: *Reimbursable, Lump Sum of Services*, etc.), according to Customer needs and Project characteristics. In the case of small/medium-sized plants, GST can also operate, on a *Target Price, LSTK* or *Converted LSTK* basis.



The following table summarizes GST's contractual capability range for the Oil&Gas Sector:

Typical Plant Value (1.000 euro = 1k euro)			GST Services
15.000 k€ <	Large-scale Plant	> 1.000.000 k€	Consulting, Process Design
	Small and Medium-scale Plant	< 1.000.000 k€	Consulting, Process Design
	Micro-plant, Plant Expansion, Revamping or Plant Unit	< 15.000 k€	TurnKey - LSTK

Disciplines

The core activity of GST is **Process Design**, which is closely tied to **Detailed Design** and all the Engineering disciplines needed to build a plant. Following is a brief description of these disciplines and what GST can do for each of them.

Process Design

In the Oil&Gas sector, which is characterized by large industrial complexes comprising many fully-integrated production units, GST can develop – as part of its core business – all-round **Process Packages** for any type of non-licensed Unit (*open art*), including the relevant utilities, while in the case of licensed Units, we can develop a comprehensive Process Design Package, based on the *Process Licensor's* data, even if the Basic Design features essential data alone. Several examples of Process Design activities commonly carried out by GST are listed among the EPC Services.

What



Engineering Disciplines

GST can also rely on a number of highly-qualified specialists in the various **Engineering Disciplines** (*Civil Works, Pressure Vessels, Piping, Machinery, Heaters and Boilers, Electrical, Instrumentation and Automation, Telecommunications*). The *multidisciplinary* nature of all the sectors in which GST operates – as well as the ongoing market trend that requires *Contractors* to deliver all-round services, regardless of their size – necessitates the capacity to engage in increasingly broader fields and state-of-the-art specialist sectors.



Services

At GST we offer a broad range of **Services**, which can be grouped into two main families: **Consulting Services** and **EPC Services**. In particular, GST operates as a **Consultant** in **Process Management** and **Project Management**, to identify and meet its Customers' business needs, by means of competitively priced professional services. With regard to EPC Services, at GST we have the know how to cover every phase in the implementation of an industrial Plant, targeting both the **Construction of New Plants** (*Grassroot or Expansion*) and the **Upgrading of Existing Plants** (*Revamping*). A detailed description of GST's *Consulting Services* and *EPC Services* for the Oil&Gas Sector is given below. Furthermore, several examples of *Consulting Service Packages*, in respect of which GST's experience may be found to be very useful and valuable, are also shown, as an example of GST's know-how in the Oil&Gas Sector.

What





Consulting Services



GST **Consulting Services** may be generally divided into **Technical Consulting** and **Project Management** Services and several **Consulting Service Packages** tailored to the **Oil & Gas** sector.

Technical Consulting and Project Management

Technical Consulting and **Project Management** Services are the services typically provided by an Engineering Firm, to support Customers across the spectrum of Project development Phases and Disciplines. Generally speaking, Consulting Services involve locating and eliminating sources of trouble (*troubleshooting*), or identifying and removing Plant bottlenecks (*debottlenecking*), Technical Feasibility Studies, etc. In order to be effective, Consulting Services must be accurate and based on specific expertise and skills, as well as timely and tailored to the Customer's needs. GST's streamlined and flexible structure is particularly suited to delivering these services. *Technical Risk Analysis* is a further example of the Consulting services we provide: at GST we can conduct these analyses based on the most appropriate assessment procedure for the specific process and the relevant implementation phase [e.g.: *PHA* during the *Feasibility Study*, *HAZOP* and *SIL (Safety Integrity Level)* during the design phase, etc.].

Conceptual Design

Conceptual Design is the phase for identifying a possible business opportunity. In the *Chemical Process Industry*, it mainly comprises defining the *Project Characteristics*, *Site* and *Process Licensors*, as well as selecting the viable alternatives. Thanks to our background, at GST we have the suitable resources and expertise to assist our Customers in developing these activities, identifying the options, listing the advantages and disadvantages for each option, evaluating the Licensors' proposals, and participating in the preparation of the final recommendation report.

Feasibility Study

The **Feasibility Study** is the decision-making tool for establishing whether and how to proceed with an investment. The Feasibility Study includes a number of steps, such as *Technical Analysis*, *Market Analysis*, project *Cost Estimate*, an analysis of the financial resources and a *ROI (Return On Investment)* report. GST assists its Customers in defining the investment scenario and thoroughly investigating the relevant technical and commercial aspects, as well as performing a detailed analysis for each step.



Project Management Consulting

Project Management Consulting comprises the services provided by Consultants, throughout a Plant's investment life cycle, and aimed at assisting Customers, with respect to effective *Project Control*, with a view to maximizing plant productivity and returns on investment. GST operates as a Project Management Consultant to identify and meet Customers' business needs, by cooperating with Customers in selecting the most suitable and state-of-the-art technology delivering competitively priced professional services.

Technical Consulting

During the implementation of a Project, a Customer may require specialized skills and *know how*, to tackle any Process Design problems (e.g.: *technology selection, technical risk analysis, materials selection*, etc.). At GST, we have the suitable resources and expertise that enable us to promptly provide tailored solutions, in respect of all Oil&Gas related activities.



Consulting Service Packages

In addition to the above mentioned Consulting Services, GST also provides several *Consulting Service Packages* – based on GST's invaluable experience in the Oil&Gas Sector – which represent an all-round answer to certain specific project problems.

Technology Selection

At GST, we can assist Customers in searching for and selecting the best state-of-the-art technology available, from among a number of options, taking into account its environmental impact, safety, *Licensor's* experience, investment costs and operating costs.

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Utility System Checks in case of Plant Expansion

In the case of Plant expansion projects, the size and capacity of the existing facilities and utilities (such as *steam*, *cooling water* and *blow-down systems*) need to be checked to assess their suitability for the new requirements. At GST, we can conduct an accurate assessment of the current status and evaluate the potential for upgrading.

Contract Management

A Customer, after having awarded a contract for implementing a Project, may require assistance in order to better review a Contractor's activities. Assessment and support activities, in fact, are necessary not only in case of reimbursable type Contracts (e.g.: the Contractor may request a refund for any items not actually due, etc.), but for LSTK Contracts as well (e.g.: the Contractor may issue a number of Variation Order Requests, which then need to be evaluated and discussed). GST can step in, with its experienced staff, to support the Customer and protect its interests.



Appraisal of Local Vendors and Subcontractors

In some cases, a Customer may need to carry out an assessment and preselection of local Vendors or Subcontractors, at short notice, before issuing a Request for Proposals for the supply of materials or construction activities. GST can perform fast and accurate assessments thanks to its qualified and experienced staff.

Process Control

From the Basic Design phase, and throughout the implementation of a Project, it is important to outline a *Preliminary Control System Architecture* and select the most suitable state-of-the-art technology, as well as to evaluate the possibility of utilizing special technical options, such as the Fieldbus or Wireless technology. It is therefore necessary to manage the various process control steps, from the preparation of the requests for proposals for the supply of *PCS*, to the preparation and implementation of the *FAT* and *SAT* procedures, also based on the S/W management and the access control policy. GST has the qualified resources to assist Customers throughout the Process Control cycle.



Staff Training

GST can also provide qualified services for Training Staff members, Supervisors and plant Engineers, by means of classroom sessions and training simulation programmes, ensuring improved self-confidence when interfacing with Plant facilities, in connection with both normal operations and emergencies situations. State-of-the-art dynamic simulators provide an effective and reliable reproduction of process plant performance, taking into account all the equipment and relevant control systems, and simulating the operations and response of the process variables when the input data are changed.



Quality Assurance

At GST we make it a point of assisting our Customers, with specialized staff, in respect of all types of Project, irrespective of size, to prepare the *Project Quality Plan*, conduct the audits and manage any non-conformities. In particular, the development of an effective Project Quality Plan from the onset of the Project enables the Quality Assurance of all the Project phases, avoiding any misunderstandings about Project's targets and the Client's expectations.

Operating Support

Based on GST's background in Process Design and Plant Start-up and Operation, we are qualified to fully support our Customers, with respect to a number of operational aspects, ranging from the planning to the execution and validation of the test runs for assessing effective Plant performance, identifying any bottlenecks, conducting energy efficiency tests, etc.



Conceptual Design for Fund Appropriation

Sometimes, Customers need to prepare a **Preliminary Basic Design** for the possible implementation of new production facilities, or the expansion of the existing ones, containing a concise description of the scope and benefits of the Project, to be presented to the Top Management, in connection with the annual budget. GST is qualified to support the Customer in shortlisting the technical options, preparing the technical report illustrating the reasons for the investment, developing – if required – an overall economic analysis, complete with a preliminary Project Schedule and Cost estimate.



EPC Services

Design and Engineering

Design and Engineering activities can be very diverse, depending on the Project type and the desired level of definition, although the final goal is always to enable a site organization to smoothly and safely build, commission and start-up a Plant, besides procuring the necessary equipment and materials. These activities, of course, can only be effectively carried out by fully-qualified all-round engineering experts. In the case of small-scale Oil&Gas projects, at GST we can develop complete Detailed Design packages, enabling the Site staff to efficiently carry out all the requisite construction activities, avoiding delays and potentially costly Site changes.

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Process Design

In the Oil&Gas sector, GST can develop – as part of its core business – all-around **Process Packages** for any type of non-licensed Unit, as well as complete/supplement the **Basic Design** produced by the Process Licensors. Following are several key examples of typical process design activities carried out by GST on a regular basis:

- development of process flow sheets, heat and material balances and P&ID's;
- process design of equipment such as heaters, reactors, columns, vessels, heat exchangers (*thermal rating*), filters, pumps, compressors, safety valves, etc., and the relevant accessories (*trays, distribution devices, mechanical seals* selection, etc.);
- selection of materials and development of materials selection diagrams;
- conversion from process to design conditions;
- technological risk analysis (*preliminary hazard analysis, HAZOP*, etc.);
- analysis of emergency conditions and identification of the controlling case (*general power failure, fire*, etc.) and relevant sizing of blow-down and flare systems;
- corrosion analysis (*H2 induced cracking, sulphide stress cracking*, etc.);
- development of the electrical load summary, etc.

Detailed Engineering

In the Oil&Gas sector, GST can rely on a number of highly qualified professionals with **Detailed Engineering** expertise, essentially employed to support and complete its principal core business: **Process Design**. For small-scale Oil&Gas projects, GST is capable of preparing all the requisite Engineering documents, based on the Customer's – or its own – General Design Specifications, tailored to the Project characteristics, if necessary, developing a complete range of Deliverables – any type of document in each single **Engineering Discipline** – (also including, where required, *mechanical catalogues* and *operating manuals*) – to ensure the safe and efficient Construction and Start-up of the Plant. We need to highlight, in this respect, that our engineering activities are always developed based on the "*Intrinsic Safe Design*" approach, which involves strict compliance with the European (e.g.: *ATEX*, *PED*, *EN 61511*) and international standards, or the best engineering practices, in the latter case, whenever the available standards are not up-to-date and in step with the most state-of-the-art technologies, as in the fastest-growing sectors.

Procurement

GST can provide all-round **Procurement** services on the basis of the **Integrated Materials Management** principle, i.e.: from the preparation and issuing of the request for proposal to the arrival of the materials at the Site. In the case of *small/medium-scale* Projects, Procurement activities may be carried out – in conjunction with the Engineering activities – on a *Turnkey* basis, with the integrated management of all the Plant equipment and materials. In the case of *Reimbursable* type Projects, GST can limit its activities to *Procurement Management* alone, providing both technical and commercial bid evaluations for each type of equipment and material – including spares – for the Customer's approval, issuing *Purchase Orders*, and carrying out supplier *Invoice Control* activities, also preparing the relevant *Authorizations for Payment*. Similar activities may be carried out with respect to Transportation, by selecting the forwarding agent, coordinating the shipments and updating the relevant shipment progress in real time.



Construction and Pre-Commissioning

Construction is the plant implementation phase, during which all the works and activities planned during the Detailed Design phase are carried out: in this phase, all the major and minor equipment is installed and commissioned to prepare the Plant for Start-up. Before Start-up it is, in fact, necessary to perform a number of preliminary operations, such as checking for proper Construction, internally cleaning the equipment and piping, carrying out leak tests, instrument calibrations, etc., which are increasingly included within the scope of Engineering Companies and viewed as a part of the *Mechanical Completion* of the Plant.

With regard to these activities, GST can assist Customers in both preparing the documents for the tendering procedure, and supervising/coordinating Field activities, including the approval of the Subcontractors' progress reports and auditing the relevant invoices. These services, in the case of *small-scale* plants can be delivered on the basis of a turnkey type Contract.

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Commissioning and Start-up

GST may provide any type of **Commissioning** service, such as running-in motors and machinery, taking the inventory of chemicals and catalysts, purging with inert gas, preparing the test run procedures, and starting-up the plant, until the achievement of smooth operating conditions.

In the case of small-scale Plants, GST can deliver all-round management services, from Pre-Commissioning to **Start-up**, including the validation of test run reports, troubleshooting and instrument data reconciliation.

EPC Services for Revamping Projects

Thanks to our background, at GST we can provide special expertise in this special type of Project, by managing the relevant technical aspects and preparing suitable construction documents. Revamping Projects require an accurate planning of the Plant shutdown, both in terms of date and duration, as well as a special design approach, in order to maximize the works that can be carried out before the shut-down. GST's experience can be useful to optimize the overall schedule and minimize loss of production. We ensure a special focus on safety, in particular as regards equipment layout definition, the necessity of work round the clock and in confined spaces, etc.

How we do it

The basis of the GST organization, how we organize our resources and the techniques we apply to tackle problems in the Oil&Gas sector.

Technological Process Line

The GST approach to Process Design is based on our experience and mastery of the **Technological Process Line** involved. A specific knowledge of the process, combined with the relevant characteristics, technical scenario and market conditions, are a prerequisite for the proper development of the Process Design, in order to ensure respect of the local environment and regulations, and meet the Customer's expectations. Based on Process Design as our core activity, at GST we are capable of broadening the scope of our activities to include the related engineering disciplines, such as *Mechanical Design, Machines, Heaters and Boilers, Electrical, Instrumentation, Automation and Telecommunications*.

Project Organization

GST is a *Customer-Oriented Company* built on an in-depth knowledge of the industry in which it operates. In the Oil&Gas Sector, our Process Design approach is based on our experience and mastery of the Technology Line involved, while the **Project Organization** is based on the **Task Force** approach, due to its flexibility and to the fact that it ensures a fast exchange of information. However, the Project Organization is constantly monitored and tailored to the Project characteristics.

Planning

In the Oil&Gas sector, where GST usually develops its Process Design activities, the issue of any document is carefully scheduled, based on the date of the incoming information and Customer needs, and in accordance with the **Overall Project Schedule**.



Estimating and Cost Control

GST can prepare preliminary or detailed **Cost Estimates**, according to the status of the Project; we also prepare Project budgets and perform **Cost Control** activities, throughout the Project's life cycle, evaluating the forecasted cost of the Plant and identifying any corrective actions.

Quality Management System

Process Design inherently involves ongoing **Quality Management**, to achieve the quality levels required by Customers. In the Oil&Gas sector, our method of operation – regardless of the complexity, scale or type of the Project – is based on well-tested, reliable and reproducible procedures applied by professionally qualified resources.

How



Project
NetSociety - Rome

Design
Aton - Rome

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