

Turnkey Projects

General Meaning & Execution

3/1/2016
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Turnkey
project



The turnkey project is one in which the contractor agrees to the client, in exchange for a fee, usually a flat rate, to design, build and operate a particular work that he previously projected.

Engineering, Procurement, Construction and Commissioning ("EPC")



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1. Introduction:

A turnkey or a turnkey project (also spelled turn-key) is a type of project that is constructed so that it could be sold to any buyer as a completed product. This is contrasted with build to order, where the constructor builds an item to the buyer's exact specifications, or when an incomplete product is sold with the assumption that the buyer would complete it.

The execution of a Turn-Key Project for an industry facility consists of three main activities:

1. Engineering
2. Procurement
3. Construction

Which are followed by Commissioning and Start-Up.

Engineering designs the facilities, produces the list, specifications and data sheets of all equipments and materials, then issue all drawings required to erect them at the construction site.

Procurement purchases all equipment and materials based on the lists and specifications prepared by Engineering.

2. Definition:

In this way, the employer or his advisors, just in the process of bidding and supervision of the work of the contractor will be involved. Turnkey, design and run the ultimate responsibility to the contractor, And as a general rule, the responsibility of every defect that occurs within the defined work, the contractor will be responsible.

In addition, the employer may to certain only turnkey Treaty for parts of the project which is known as (Partial -Turnkey) or (Semi-Turnkey).

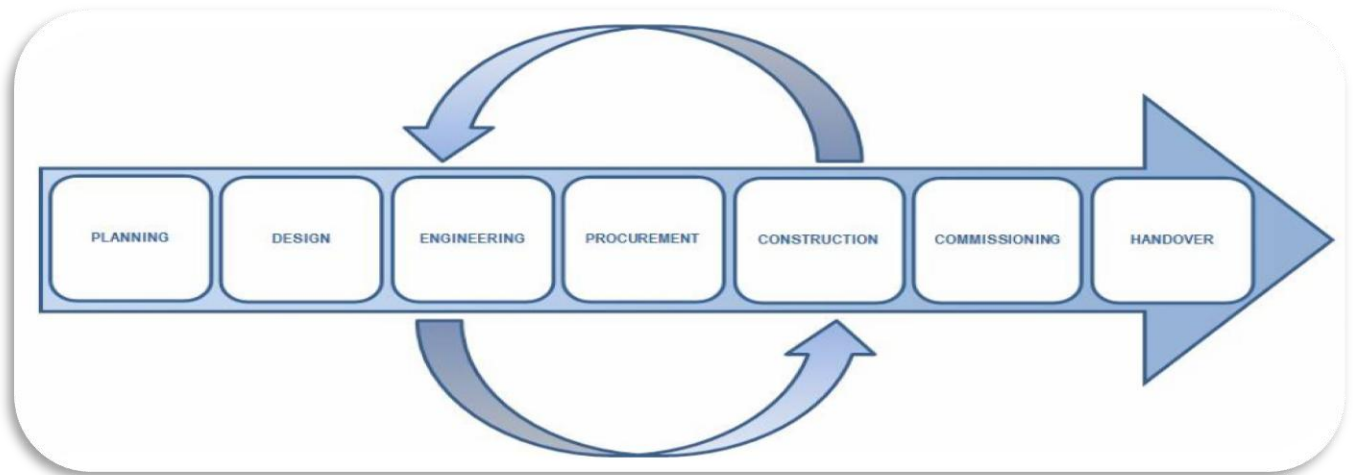
3. Execution Plan:

“EPCC” is the design, procure, fabricate, install and commission process modules and equipment for oil and gas exploration and production on a turnkey project basis. These modules and equipment will form the operating system of the production and storage facility for oil and gas.

Offshore oil and gas activities are capital intensive and time-sensitive. The Group has, over the years, built up extensive capabilities and track record for fast-track projects.

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In executing each EPCC project, the Group will assign a Project Team to approach the given tasks. And in each team, one Project Manager will lead the team in project schedule planning, design, procurement & contract administration, construction, progress reporting, commissioning and other tasks. The team will consist of a Design Engineer, Mechanical Engineer, QC Engineer, Instrumentation Engineer and other supporting staffs where applicable.



4. Advantages of “EPC” Agreement:

The main benefits of “EPC” contract, which attracts employers and contractors in this way are including as follows:

- Stress Reduction of owner
- Improving risk management for the employer.
- Usually the fastest way to implement the project.
- A contractor is responsible for the design and construction.
- Money and Time Saving.
- Requires less management and coordination by employer.
- Having confirmed the initial price, the initial project cost and schedule.
- Direct communication of Client (employer) with a contractor and facilitate the implementation of the work.
- Contractor involvement in the design process.
- Ensure quality and reduce the practical issues.

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- Safe margin exists for the owner such as: fluctuations in the price of materials, manpower and etc.
- Preparation for launch services
- Employer certitude for the ultimate amount and timing of definitive end.
- These projects have been implemented more quickly; so payments have to be made in a timely manner.
- By using this method, financing attraction is done more easily.

5. Disadvantage of “EPC” Agreement:

According to the views of experts, some disadvantages for EPC projects are included in the following areas:

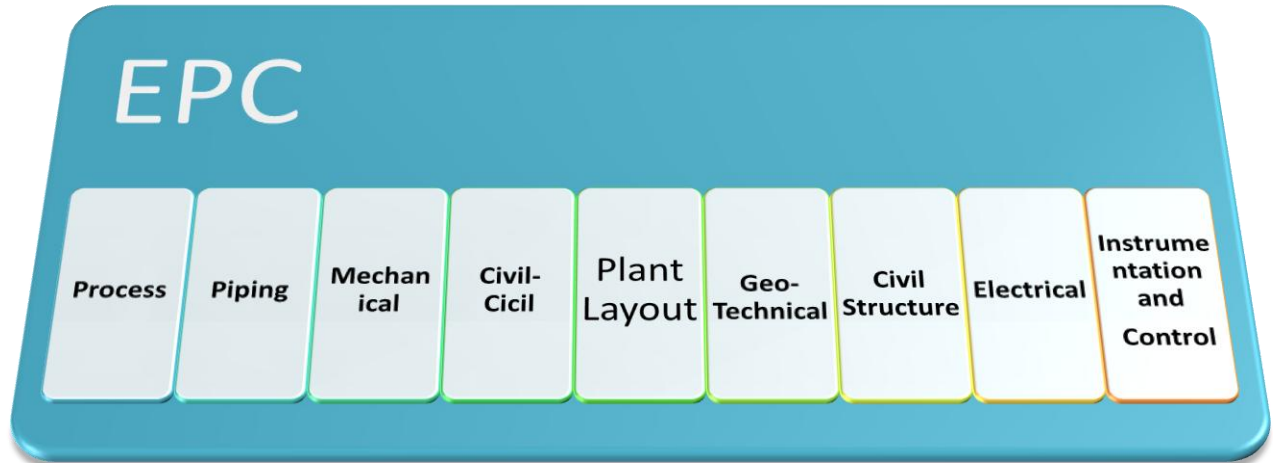
- EPC contractor may, for maintaining their profits margin, provide fewer services than a tender procedure and therefore, the price of the project implementation is not competitive.
- Employer conflicts, usually confined to the early stages of the project.
- When saving and design changes will be determined by the EPC contractor, may reduce the quality hidden in there.
- Executive documents until the obligation is not met could not be completed and may disagree about the quality and designs of work, exist in future time.
- Conflicting views as a designer and builder.
- The non-continued presence of the representative of the employer, to confirm the comments during project implementation.
- Lack of normal controls and so there is a balance between the designers and builders.
- If the contract is not integrated together, may cause confusion and inefficiency of work.

6. Contract amount:

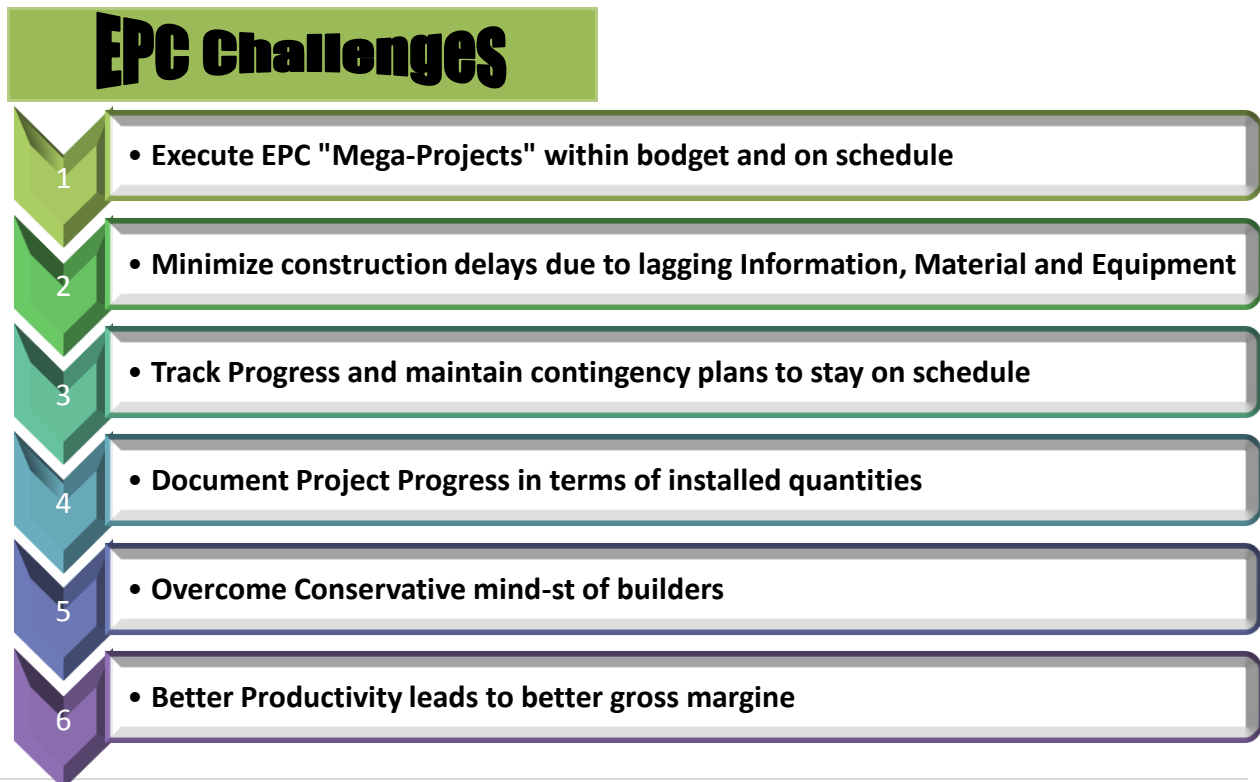
In this type of contract, project scope, requirements and specifications that led to the formulation of the scope of work will determine accurately, and then fixed-price contract to perform the work is concluded. Specifically in this case, the contractor should carefully review scope of work in any aspects, and even if the project is not already designed, it must be designed into the grandly aspects by contractor, and then enter the bidding.

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7. "EPC" Engineering Disciplines:



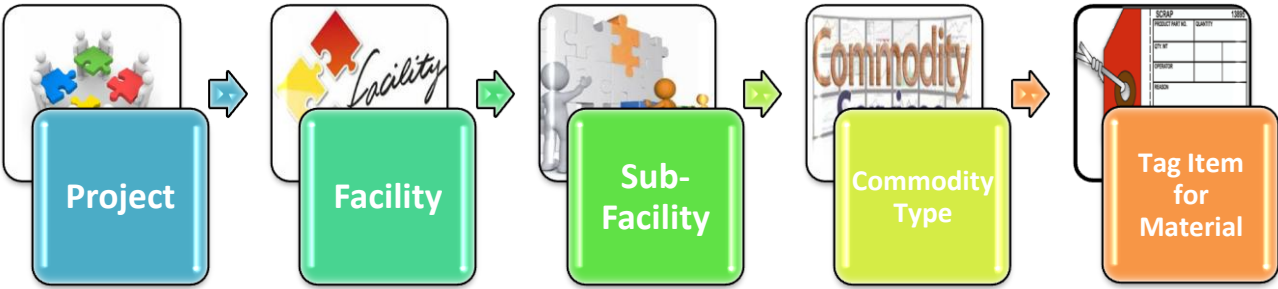
8. "EPC" Challenges:



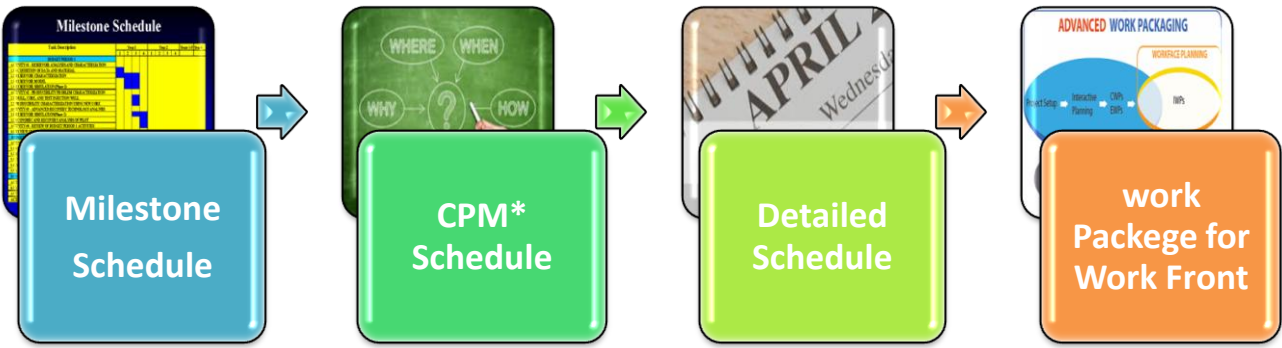
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9. Departments and levels of the Project:

Physical Breakdown



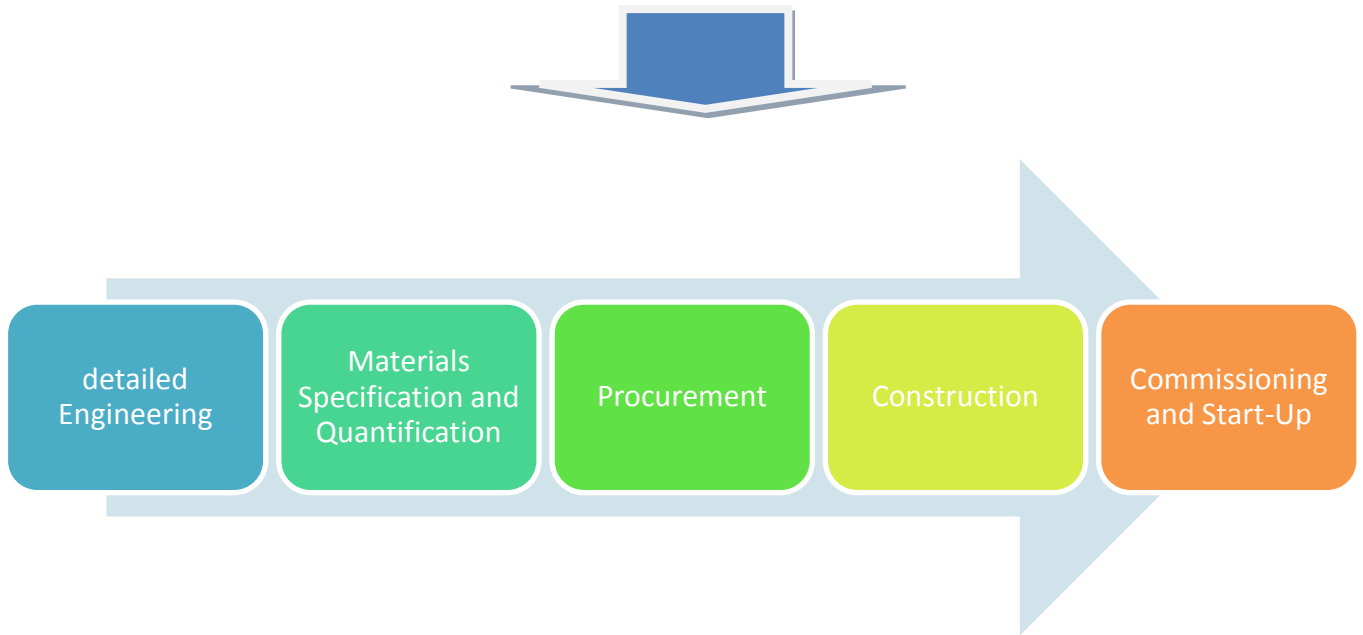
Temporal Breakdown



** CPM: Critical Path Method Schedule

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Sequential Breakdown



10. Cycle of each "Object":

| Item | Action | By Who? |
|------|---------------------------|-----------------------|
| 1 | SPECIFY & DESIGN | Engineering |
| 2 | APPROVE & ISSUE | Engineering |
| 3 | PROCURE | Procurement |
| 4 | FABRICATE, TEST | Fabricator / Supplier |
| 5 | INSPECT & SHOP RELEASE | Procurement |
| 6 | EXPEDITE / SHIP / RECEIVE | Procurement |
| 7 | WAREHOUSE / RELEASE | Procurement |
| 8 | WITHDRAW and STAGE | Construction |
| 9 | ERECT / INSTAL | Construction |
| 10 | INSPECT / ACCEPT | Field Engineering |

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11. Quality Control and Monitoring in “EPC” Contracts:

The organizations which can evaluate EPC Implemented Projects in quality control aspects are those organizations that use and mind “TQM”.

Notice: From the 1980s onwards, the discussion on Total Quality Management or TQM was introduced in the world and many large contractors were given to his world.

Because of this method is providing the limited control for employer over the project, and must not interfere in the work of contractors, employer monitoring of progress and ensure compliance with the project time schedule, control of the quality specified, tests performance and etc. will done by representative of employer.

Basically in such contracts, the employer agent is responsible for the project monitoring and control task.

Fundamentally, the employer agent who must do the work of quality assurance and take the disposal of an employer must be qualified and have the necessary expertise in issues related to the project. Therefore, consulting engineer can only assume these roles that have sufficient expertise in the same projects field to take the lead.

Part of the consulting engineering tasks:

- Monitoring of construction
- Project Management
- Quality Management
- Construction Management
- Cost management
- Case study and work order (Commission)
- Termination of Contract
- Legal (Arbitration) Services
- Technical Training
- Analysis Risk Management
- Investigation of Value Engineering

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12. Conclusion:

Welcomed the international markets of “EPC” contracts and also employers’ invitation to make greater use of this type of contract, in the first instance, ensure the employer or the owner for the final price and final estimation of time ending schedule. Time changes in projects that are executed by “EPC” manner are very low. Because the penalties intended for the parties in the contract are high. The penalties are really implemented in “EPC” contracts, and the parties are trying do not pay these type of penalties.

When, private capital (Finance) use for the implementation of any proposed contract, “EPC” type contracts should definitely be used.

One of the other existed cases in “EPC” contracts is presentation of the filth responsibilities and division of work. Basically, in the “EPC” contracts, the responsibility is required from an institution. In other words, the responsibility is not fragmented.

As a result, responsibility for implementation, testing, performance and equipment, is entirely the responsibility of the contractor.

According to the presentation, the following can be concluded:

1. Allocation Risk in “EPC” Contracts, compared to other methods is more reasonable and mutually risks are minimal for involved parties.
2. For certainty on the final price of project, design and construction methods, especially the “EPC” contracts, using them flourished.
3. “EPC” contracts and general conditions of contract method that are using FIDIC*, are appropriate for industrial projects and also the projects that major amount of the contract are related to the procurement and installation of major equipment and technology is responsibility of contractor, so there is no need of processes to monitor in details.

***(Fédération Internationale Des Ingénieurs-Conseils- FIDIC in French Language)/
(International Federation of Consulting Engineers – FIDIC in English Language)**

4. “EPC” method and the general conditions of FIDIC contract are recommended for the projects that estimate costs and execution time with a close approximation is possible.

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5. FIDIC have been made fundamental distinction between design and construction and EPC contracts and is recommended a separate type of prepared documents for them.



Appendix 1 FIDIC Definition



FIDIC is the International Federation of Consulting Engineers. Its members are national associations of consulting engineers.

Founded in 1913, FIDIC is charged with promoting and implementing the consulting engineering industry's strategic goals on behalf of its Member Associations and to disseminate information and resources of interest to its members. Today, FIDIC membership covers 97 countries of the world.

FIDIC, in the furtherance of its goals, publishes international standard forms of contracts for works and for clients, consultants, sub-consultants, joint ventures and representatives, together with related materials such as standard pre-qualification forms.

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FIDIC also publishes business practice documents such as policy statements, position papers, guidelines, training manuals and training resource kits in the areas of management systems (quality management, risk management, business integrity management, environment management, sustainability) and business processes (consultant selection, quality based selection, tendering, procurement, insurance, liability, technology transfer, capacity building).

FIDIC organizes the annual FIDIC International Infrastructure Conference and an extensive programmed of seminars, capacity building workshops and training courses.

FIDIC OBJECTIVES

1. Be the recognized international authority on issues relating to consulting engineering best practice.
2. Actively promote high standards of ethics and integrity among all stakeholders involved in the development of infrastructure worldwide.
3. Maintain and enhance FIDIC's representation of the consulting engineering industry worldwide.
4. Enhance the image of consulting engineering.
5. Promote and assist the worldwide development of viable consulting engineering industries.
6. Promote and enhance the leading position of FIDIC's Forms of Contract.
7. Improve and develop FIDIC's training and publishing activities.
8. To promote and encourage the development of Young Professionals in the Consulting Engineering Industry.

Appendix 2

Economic, Finance & Contract Abbreviations



1. **AFE** – Authorization for Expenditure
2. **BB** -Bid Bond
3. **BEP** -Break Even Point
4. **BOM** – Bill of Materials
5. **BR** -Budget Requisition
6. **CAPEX** - Capital Expenditure
7. **CFT** – Call for Tender
8. **CI** – Capital Intensity
9. **DB** - Declining Balance – used for depreciation calculation
- 10.**DCC** – Decision Cycle Compression
- 11.**DDB** - Double Declining Balance (2nd Order Depreciation Curve)

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- 12.**DIO** - Days Invoice Outstanding
- 13.**DSO** - Days Sale Outstanding
- 14.**EMV** – Expected Monetary Value
- 15.**E&P** – Exploration & Production
- 16.**FP** – Finance Proposal
- 17.**FPV** - Future Present Value
- 18.**FTA** – Free Trade Agreement
- 19.**GSA** - General Service Agreement
- 20.**ICE** – InterContinental Exchange
- 21.**IRR** – Internal Rate of Return
- 22.**JV** - Joint Venture
- 23.**LC** - Letter of Credit
- 24.**LD** - Liquidated Damages
- 25.**LLC** - Limited Liability Company
- 26.**LOI** - Letter of Intent
- 27.**LTDP** – Long Term Development Plan
- 28.**LVBR** – Low Value Budget Request
- 29.**LVPO** - Low Value Purchase Order
- 30.**MOD** – Money of the Day
- 31.**MODA** – Manual of Delegated Authority

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32.**MOU** - Memorandum of Understanding

33.**MWO** – Minor Work Order

34.**NFA** – No Further Activity

35.**NOC** - Note of Completion of Work or No Objection Certificate

36.**NPC** – Net Present Cost

37.**NPV** – Net Present Value

38.**NYSE** – New York Stock Exchange

39.**OPEX** – Operating Expenditure Economics, Finance, Contracts Economics,
Finance, Contracts

40.**PBG** - Performance Bank Guarantee

41.**PI** - Profit to Investment Ratio

42.**PID** – Project Identification Document

43.**PMC** – Project Management Consultant

44.**PMT** – Payments

45.**PO** – Purchase Order

46.**PR** – Purchase Request or Profit Rate i.e. interest rate

47.**PSA** – Production Sharing Agreement

48.**PSC** – Production Sharing Contract

49.**PTW** – Permit to Work

50.**PV** - Present Value

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- 51.**R&D** – Research & Development
- 52.**RFI** - Request for Information
- 53.**RFQ** - Request for Quotation
- 54.**ROI** - Return on Investment
- 55.**SFA** – Straight Forward Award
- 56.**SH** -Shareholders
- 57.**SHA** - Shareholders Agreement
- 58.**SOR** – Statement of Requirements
- 59.**SOS** - Scope of Services
- 60.**SOW** – Scope of Work
- 61.**SRN** – Service Receipt Note
- 62.**T&C** - Terms & Conditions of a contract
- 63.**TIP** – Tender Invitation Package
- 64.**TM** - Trade Mark
- 65.**TO** – Task Order
- 66.**TOR** – Terms of Reference
- 67.**UTC** – Unit Technical Cost
- 68.**VIR** – Value Investment Ratio
- 69.**VO** - Variation Order (Change Order too)
- 70.**VOI** – Value of Information

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71. **WTI** – West Texas Intermediate

72. **YTD** – Year to Date