



# Amazon



**Amazon Oil Services**



الأمازون للخدمات النفطية

June 2021



## Employee Profile

Nelson R. Bermejo,  
Senior Petroleum Engineer

## Travel News

The Mechanical Engineering approach to EPC Projects

The importance of Communication

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Guidelines for Selecting Petroleum Upstream Investment Projects

# Amazon

Ben Zeglam - Section / Nofleen, Abosetta  
(Shuhda Alshatt St. Next the Light Signal)  
P.O. Box 81292 Tripoli Libya | License No. 5409882  
Commercial Registration No. 9882 Chamber of Commerce No. 1448  
Tel./Fax: 00218 21 340 9185 | M: +218 92 804 9559 or +218 91 321 8249  
E: aghali@ao-s.com or amazonoilservices@ao-s.com | www.ao-s.com



Message from the

## General Manager

### Year in Review 2020 and Year to Come 2021

January 1st, 2020 was not only the beginning of a new year but the beginning of a new decade and a time to reflect on previous years to evaluate how far we have progressed and accomplished under somewhat difficult circumstances and a time to consider our objectives for the future. The year 2020 has proven to be a year of unparalleled events which we trust and hope to never experience again. The worldwide Covid-19 pandemic has had a profound impact on you, our employees, your families, and we as a Company. Whereas we recognise that our ability to provide travel arrangements has been somewhat blighted by these exceptional events, we have been able to repatriate most employees as required, however this would not have been possible without your understanding, resilience and patience for which I am truly grateful.

The reality of the situation has exceeded our worst fears. However, life goes on and we must set our sights beyond the pandemic and pray that 2021 will prove less dramatic and we will all enjoy a successful year. We continue to reap the fruits of our exceptional experience acquired over the years ensuring that **Amazon** employees experience an incomparable sterling service whilst employed in Libya. My staff and I continue to ensure fulfilment of this objective to the best of our ability which is demonstrated by the positive results received from Employee Satisfaction Surveys.

I would take this opportunity to thank my fellow colleagues who continue to ensure our ongoing success and compliance with the ISO accreditation achieved. The **Amazon** Newsletter has proven to be a success with positive feedback received from our Clients, Employees and other readers and I appreciate the valued input from Contributors and the Editorial Board ensuring continued publication of this valued circular.

**Amazon** Oil Services continues to strive for perfection and through the years we have enhanced our reputation by listening and understanding the ever-changing challenges being faced by our clients within the Oil and Gas sphere of operation.

In order to yet further enhance our skill base we have now established a dedicated TECHNICAL DEPARTMENT within the **Amazon** organization managed by a professional engineer who will apply his engineering skills in assessing our clients bespoke requirements thus delivering an enhanced quality service and dedicated client / customer experience. In addition, the Technical Department will now support our Recruitment Team in the compilation of accurate job descriptions thus ensuring that CVs submitted to our clients are tailored to their specific requirements and candidates submitted meet these requirements in full thus ensuring long term retention pivotal to our ongoing success. Consideration is also now being given to the Technical Department undertaking additional bespoke projects and services within the capabilities of **Amazon** Oil Services based on their proven track record within the industry.

I take this opportunity to wish you, and your families, all the best for 2021. Be safe and positive – I wish you all well.

*Ahmed - Mohamed El-Ghali*



**Amazon Oil Services (AOS)** is a Libyan incorporated Company, with ISO 9001: 2015 accreditation. The Head Office is in Tripoli and AOS has associates worldwide.

AOS serves the Libyan Oil & Gas Sectors in the provision of an Umbrella Service for Engineering and Technical Support using highly skilled nationals and expatriates from all over the world.

Additional services and expertise offered includes Project Management, Consultancy, Procurement and Training.

**Amazon** ensures the Client benefits and achieves value for money where quality is of paramount importance.



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# AMAZON Travel News



The year 2020 saw its fair share of major unprecedented events requiring **Amazon** to constantly review their operational protocols. Whereas the ongoing armed clashes continued to impact reliable travel to/from Tripoli and constant changes as to whether Mitiga or Misrata Airport was the operational airport, life as we knew it came to a grinding halt as the coronavirus pandemic left countries struggling to respond to the rapidly spreading virus. The coronavirus as we now know causes a respiratory disease known as COVID-19 which has prompted borders and airspace to close and airlines to restrict operations thus having a profound impact on those seeking to organise international travel. The rapidly evolving nature of events and actions taken by countries and airlines with unprecedented and at times unexpected restrictions and requirements, created some challenging situations however, where possible, we were able to find solutions in such events albeit possibly not as perfect as one would wish. Unfortunately, at this time, we still face a myriad of restrictions and challenges and Covid-19 travel requirements, however continue to determine possible viable solutions to

same. It is salient to note that we have still been able to recruit new employees as required by our clients.

In early March 2020, we advised our employees that world travel restrictions due to the Coronavirus situation were being imposed and strictly regulated and indeed one of our Clients formally advised that they would not allow Expatriate Nationals returning to site until further notice. As there was a strong possibility that other clients, or authorities, would impose similar restrictions we advised our employees either to travel home on schedule or, remain in Libya until the restrictions were rescinded. At that stage, there was no indication just how long these restrictions would remain in force or, the global severity of the situation which has proven beyond anything encountered by this current generation.

As a 'family orientated' employer, **AMAZON** was fully aware of the concerns and frustration being experienced by our employees and accordingly ensured that we continued to issue memorandums as the unprecedented situation developed. Unfortunately, as a company our ability to make travel arrangements

became virtually impossible as internal flights from Brega with Petro Air ceased to operate and Libya and Tunis closed their airports and airspace. Our employees virtually became prisoners at this time with NO viable travel options being available!

Whereas there was limited egress from Benghazi this was not a viable solution we could consider, bearing in mind that employee passports were located in Tripoli notwithstanding other prevailing undercurrents and our employees were advised accordingly.

When limited flights to Istanbul became available, there was an understandable desire to take the opportunity to travel home to worried families. As no internal flights were available the only other option would be by road transport, which due to the prevailing security situation such a method of egress was ill advised and fraught with potential risks and ramifications. There is, however, an understandable limit to each individual's level of patience and one individual decided that he would travel by road irrespective of the risk or managements well founded concerns! In this instance, we required to have the individual sign a Waiver of Liability



due to the high level of potential risk involved. Thankfully, he arrived safely in Tripoli and we were able to arrange travel to his home airport.

On resumption of the Petro Air flights, employees who wished to travel home completed their travel request and on receipt we made the necessary arrangements and although each destination presented unique bespoke requirements, we were able to determine solutions to ensure unfettered travel. We did, however, face additional problems for non-European flights.

One unfortunate individual had his international flight cancelled shortly before departure from Mitiga. With difficulty we managed to get him back through passport control whilst we worked on an alternative flight. Understandably, the individual found it difficult to accept cancellation at such a late stage however accepted the same when we forwarded a copy of the cancellation received from the airline. It became known that there was a repatriation flight available arranged by the individual's government and a seat was available for him. Travel arrangements were swiftly made to meet this new travel schedule however at the last minute we were advised that the seat was no longer available! One can well imagine the unimaginable impact on the employee's mental state at this time, however several hours later we were informed that a seat was available at a later date and accordingly revised travel arrangements were made and we wished the employee farewell on the assumption that all was well. We did not anticipate that on his arrival in Istanbul he would be subject to an earthquake and on the last leg of his journey he would face a hurricane delaying his onward flight! We kept in contact through WhatsApp at each stage of the journey until we received confirmation that he was safely home.

This series of unusual events was however surpassed by another employee destined for India via Doha - a route followed many times without mishap on previous occasions. Arrangements for this trip were actioned some time before following all known requirements at that time. Both ourselves and our agent were somewhat surprised when we were informed that he was denied boarding as the last leg of the journey from Doha to India was not recorded on the flight manifest. This presented an immediate problem as being an Indian National he could not pass-through Passport

Control in Istanbul nor could he return to Libya without a Covid-19 test and valid visa. Our immediate action was to arrange accommodation in the Yotel Hotel Airside, however this initially proved impossible as their protocol would not allow a reservation without a valid air ticket!

A revised ticket was issued and residence for the night was granted in the hotel. However once again when he attempted to check-in boarding was denied. Neither we, our agent, nor the airline could ascertain why boarding was being continuously being denied as the employee was not recorded as approved to board on the Indigo manifest and we later identified he had not been approved to travel to India by the appropriate authorities in India. This became a classic catch-22 situation with no known solution compounded by the fact that the validity of the Covid-19 Test Certificate had expired.

We found ourselves in uncharted territory and were left with no alternative than to seek assistance from the Indian Embassy in Turkey. Following a series of communications with the Embassy First Secretary it was discovered that transit via Doha by non-Qatari nationals was being denied due to Covid-19 - a restriction imposed subsequent to issue of the tickets and unfortunately not clearly circulated to airlines and agents. With the assistance of the First Secretary and the MD of our travel agent who managed to arrange an in-house Covid-19 test which previously had proved impossible as testing booths were located in the Landside of the airport and were thus out of bounds to individuals who could not pass-through passport control.

Revised travel arrangements were made, meeting all requirements as advised by the First Secretary who was able to clear passage through Doha and on the 7th day our employee was able to travel home without further problems. **Amazon** kept in constant contact with the employee and his family at all times during this unparalleled situation ensuring all concerned were fully in the picture. We were aware that another Indian employee was destined to travel via Doha in the future so we immediately cancelled his ticket and being aware that there was a so-called 'Bubble' route via Paris we contacted the Indian First Secretary in Paris for guidance. On receipt of clear guidance, we are pleased to advise that this employee was able to travel without

mishap to his destination.

To yet further complicate our ability to provide a previous sterling travel service we now face limited seat availability due to social distancing, the non-existence of previously available direct flights, a substantial increase in costs, ever-changing Covid-19 imposed unique travel requirements, specific nationality restrictions, quarantine on arrival at home airports, notwithstanding a raft of unprecedented bureaucratic requirements to be completed by the employee before travel.

These events bring home the current complexity in making travel arrangements during these difficult times. Whereas **Amazon** travel protocol requires receipt of Travel Requests well in advance of the required travel date, recent events demonstrate that restrictions and requirements are subject to change with little or no warning. Both **Amazon** and our Agent continue to monitor the situation on an ongoing basis and ensure that our employees are advised of any material change in circumstances. At all times we continued to have their welfare and safety foremost in our minds and trust that 2021 will see an end to Covid-19 and we will be able to return to some form of normality.

In addition to the Planit 'plus' system and the Covid-19 vaccination programs being rolled out exponentially worldwide, we are now cautiously optimistic that the pandemic which we have experienced since early 2020 will become an endemic and current draconian travel restrictions will be lifted and airlines will resume some form of normality. We have already been made aware that Flydubai intend to resume services in October, KLM are increasing passenger numbers to the Philippines and Europe will admit vaccinated passengers this summer. Worldwide, consideration is being given to travel corridors without restrictions between countries with successful vaccination rollouts and some form of affordable, simple and proportionate testing to replace quarantine requirements with digital passes for testing and vaccination documentation to facilitate seamless future travel using contactless technology. Needless to say, each airline and country will implement these changes depending on local conditions and effective vaccination programs however we are now moving in the right direction.

# Duty of care in travel

The Covid-19 pandemic brought huge technological advances to the travel industry, amongst which are extensive duty of care solutions.

By using state-of-the-art travel technology, corporate travel managers will now be able to check current travel restrictions and ascertain the requirements for travelling to a specific destination. This is where Planit Plus comes in; it is the technology platform that makes corporate travel simpler and more efficient. Planit Plus empowers business travellers and travel managers to efficiently, intelligently and effectively manage all aspects of the corporate travel program, consistently saving time and money. This technology understands the need for easy access to data and accuracy, as well as knowing the latest travel restrictions and any incidents that might undermine the traveller's safety and mobility around the world.

Planit Plus has several powerful features that together revolutionize the corporate travel industry.

**+ Profile Management made simple.** For many organizations, managing traveller information is cumbersome and time-consuming. The Planit Plus profile system provides clients with a very functional and easy-to-use solution that allows users to control important traveller data. Integrated into the platform, profiles synchronise automatically with online Booking Tools, GDS and third-party systems. For the traveller, this means that they give their information only once, and their preferences such as preferred airlines, seats, frequent flyer numbers and meal preferences are stored and used whenever the traveller makes a booking. No more mistyped names, no more repeating information or forgetting to renew their passport.

**+ Streamlined Travel Requests:** Booking requests and pre-trip approvals. Highly configurable in terms of managing company travel policies and approvals. Integrated with travel alerts and seamless duty of care functionality.

*Planit Travel Services Ltd. is a corporate travel management company established in Malta in 1996; servicing the Oil & Gas industry with their corporate travel requirements.*

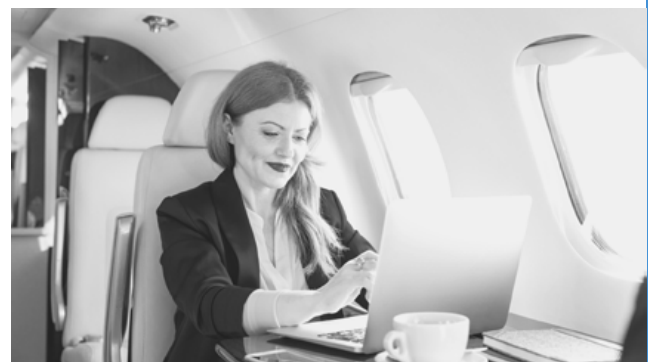


**+ Trips:** This feature provides simple access for travellers to view all current and future trips, while travel coordinators can view all trips they have booked for their travellers. This service also provides travel alerts and highlighting warnings related to itinerary destinations.

**+ Care:** With sophisticated traveller tracking, visibility of travellers at their destinations, travel alerts, easy communication (including two-way SMS). A global alert system keeps travel managers and travellers up to date about any incidents occurring in places where your employees are travelling. Through the traveller tracking tool, travel managers can visualise the traveller's location on a map, and verifying their safety with easy communication via email or SMS.

**+ Intelligence:** Genuine business intelligence with easily accessible charts and dashboards. Provides current travel spend, instant comparisons with last year or last quarter, airline deal management and forecasting.

Further information about the duty of care and the Planit Plus tool can be found on our website, [www.planit247.eu](http://www.planit247.eu).



# Guidelines for Selecting Petroleum Upstream Investment Projects

Author: Babalola DARAMOLA (consultant senior reservoir engineer,  
[bablo@propellioenergy.com](mailto:bablo@propellioenergy.com))

Petroleum assets are developed for economic gain. A typical petroleum upstream asset consists of underground reservoirs which hold the crude oil and natural gas, wells drilled into the ground to produce the oil and gas, and topside facilities to process and transport the hydrocarbons to the market. Figure 1 shows a map of some of Libya's oil and gas fields.

Petroleum is refined into a wide range of fuels including petrol (gasoline), diesel, kerosene, jet fuel, lubricants, fuel oil, and road tar. Other petroleum derivatives include charcoal, agricultural fertilisers, cooking

gas, natural gas for power generation, plastics, polyester clothing, dry-cleaning solvents, paint thinners, and medicinal oils. Petroleum upstream assets also create numerous jobs and deliver significant royalty and tax revenues to host country governments.

Petroleum economics evaluations are used to justify capital and operating expenditure projects in the petroleum industry. The following are required to build an economics model for a petroleum upstream asset:

1. Oil and gas production and sales forecasts,
2. Capital and operating costs,
3. Economic model

assumptions, and

4. Economic model (software or Excel spreadsheet).

The following guidelines are recommended for selecting petroleum upstream investment projects:

1. Select projects with positive NPV (profit making business).
2. Select projects with profit to investment ratio above 0.5 (50% profit).
3. Select projects with DCFR above 25%.
4. Select projects with payback period below 5 years. This allows the capital to be recovered quickly and invested in new projects.
5. Select projects with breakeven oil price below 20 USD/barrel. This will deliver profitable assets during high and low oil price periods.

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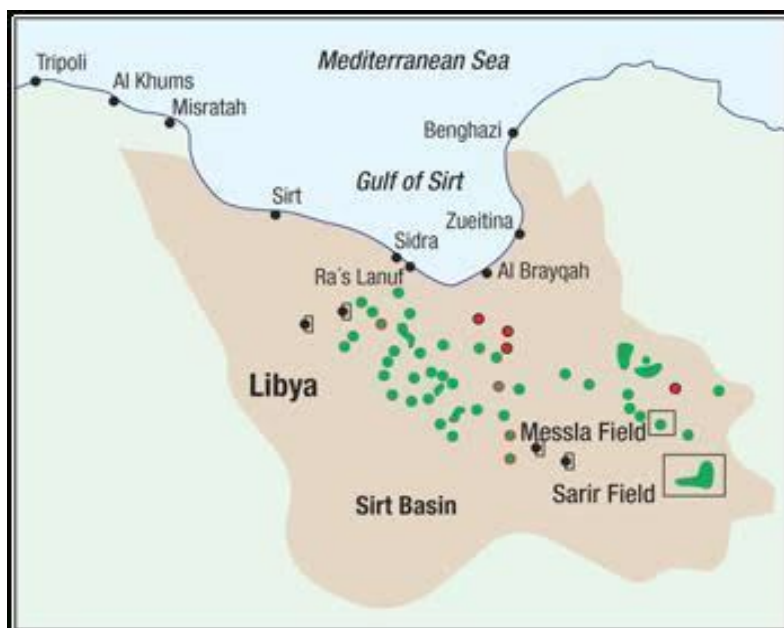


Figure 1 — Libya's Oil & Gas Fields



*Success is an iceberg...*

**Success!**

**THIS IS WHAT  
PEOPLE SEE**

**WHAT PEOPLE  
DON'T SEE**

- Hard Work
- Persistence
- Late nights
- Rejections
- Criticism
- Sacrifice
- Doubts
- Disappointment
- Dedication
- Risks
- Trials & Errors

# The Mechanical Engineering approach to EPC Projects.

By David Amesty

## Introduction

The acronym EPC stands for Engineering, Procurement and Construction usually associated to large-scale and long-term projects. As such, the term EPC is applicable to any project that comprises the engineering, procurement and construction of any infrastructure in any market. For certain small-scale/short-term projects, based on cost-risk assessment, the EPC life cycle procedure can be applied to them with success. Civil and transportation infrastructure, energy production facilities and farms, mineral processing and petrochemical plants are markets where the application of EPC cycles for Projects is well known; however, the term is deeply rooted to industrial facilities, coined in particular with the hydrocarbon, mining and energy sector.

## Projects are an Important Part of the Strategic Planning

As part of the strategic business planning of the Company, Sponsor or Owner, projects are needed to cover some opportunities for growth. An EPC Project, or EPC, is the result of the initial screening process performed to select projects initially proposed as “strategic” objectives. Once selected, it then becomes a “flow-down” objective, to be executed by the Company necessary to assure its presence in the market (or in new ones).

In Kloppenborg, Anantatmula, and Wells, book “*Contemporary Project Management*” 4<sup>th</sup> Edition the EPC model can be defined as a “Construction Project Life Cycle Model” that constitutes five (5) phases: Pre-Planning, Design, Procurement, Construction and Start-Up. The EPC comprises then the Pre-Planning constituted by pre-FEED, FEED and preliminary BED, the Design phase with final BED and Detail Engineering, the Procurement phase, the Construction phase and the Start-Up phase that includes Commissioning and Handover to the final user.

The EPC is usually assigned to EPC Companies specialized in these processes with the know-how acquired along years of experience. These companies manage finance, design and execute the EPC. Some Companies decide to associate forming consortiums with independent Organigram and financial resources to deal with the largest EPCs. The

Consortium though will last the life of the project or program of projects if there are many coming up.

## The EPC Stages

The Project Sponsor decides how to divide the stages of the EPC which are traditionally structured as follow: pre-FEED, FEED, BED, Detailed Engineering (DE), Procurement and Fabrication, Construction, Installation, Mechanical Completion, Commissioning and Start-Up. On large projects, the traditional approach is to define clear cuts among pre-FEED, FEED, BED and DE. DE overlaps with Procurement and Construction; it is the driver of the whole EPC. That traditional approach is a Predictive Style of Project Management, a plan-driven approach where the scope is well understood and where all planning precedes all execution. This approach is key to reduce financial risks, to take changes under control and to foresee unpredictable situations to the most as possible. The Predictable Style however is not flexible enough to handle continuing and recurring changes in projects that, if well managed, that is not a threat.

## The Project Life Cycle Described

The EPC may span from its conceptualization in pre-FEED/FEED/BED engineering (Initiation) to commissioning of the facility (Closing), all the steps executed and managed by the same EPC Company. That whole project span is known as EPC Turnkey or Lump Sum Turnkey.

Pre-FEED: A preliminary FEED to determine preliminary major costs of investment, mainly on large EPCs. For small ones pre-FEED is not worthy and merged with the FEED.

FEED: Front End Engineering Design. It is an engineering project that comprises the conceptual design of the project to determine its feasibility, risk of investment and profitability to the investors.

BED: Basic Engineering Design. The step after the FEED though depending on the size of the Project, BED and FEED could be merged together. The BED is the platform, basis for the design and specification in Detail Engineering, Procurement and Construction phases.

DE: Detail Engineering. The completion phase of the engineering initially developed in the BED. DE provides all details for procurement, fabrication and construction, oversees the design and supports Supply Chain, QA/QC, Construction and Operations Departments during the execution.

Procurement: also known as the Supply Chain Management (SCM), it is in charge of supplying all the materials, parts and equipment for installation in the facility. It looks after the fabrication, quality control, expediting, logistics and transportation of assets outside the site field. The SCM manages purchase and contract orders awarded to vendors and contractors.

Construction: the part of EPC responsible for the actual construction. It comprises site fabrication, installation, mechanical completion, commissioning and start-up. It manages important site aspects such as safety hazard risks and HSE review, constructability, work packs and job cards, labour relationships, contractors’ milestone oversight, execution as per engineering requirements, and close out dossiers.

Engineering, Procurement and Construction (EPC) teams and groups are intermingled and require the support of each other for the successful completion of the project.



## Mechanical Engineering

The responsibility of Mechanical Engineering in industrial EPC Projects, or EPCs, is considerable. It contributes to more than 50% worth value of the procured assets and for the design, specification and completion of more than 50% plant value during the construction.

Therefore, Mechanical Engineering has an important role on the adequate execution of the whole EPC. For that reason, the organization and management of the Discipline is a priority, it is the prime mover for the hardware that will guarantee the correct performance of the plant (process equipment, ancillary systems and piping).

Depending on the size of the project, the Mechanical Engineering might be divided into three mayor branches:

- 1- Equipment Mechanical Engineering (Mechanical Discipline): major equipment for process, utility and outside battery limits systems.
- 2- Piping Mechanical Engineering (Piping Discipline): piping lines connecting and servicing the equipment including as well specialty items and valves in their scope.
- 3- Energy Systems Mechanical Engineering (MEP Discipline): ancillary systems, HVAC, Buildings, Dust Control, Fire Suppression, Lube Oil, Fuel Gas, Water Services systems.

That division might not be that sharp, Disciplines would have overlapping duties or shared responsibilities depending on the size of the Project and preferences either by the Sponsor or by the EPC contractor.

The particular case of the MEP Discipline, it assumes further responsibilities by preparing mass and energy block diagrams, PFDs, P&IDs, equipment sizing and material specifications usually under the responsibility of Process and Materials Engineering.

### The Mechanical Discipline

The main function of Equipment Mechanical Engineering is to look after the design, specification, procurement, installation and site erection of all the Mechanical Equipment in the facility. Among the Mechanical Equipment there are divisions and subdivisions separated

by Groups in the Discipline based on type of equipment and specialties.

#### *Static Equipment Group*

Deals with equipment with no moving part. It might be subdivided into Storage Equipment (tanks, hoppers and silos) with design pressure not higher than 15 Psi, Heat Exchangers (S&T, P&F, Hairpin, Spiral, others) with any pressure capacity and Pressure Vessels (towers, reactors, drums, bullets, spheres) with design pressure higher than 15 Psi.

#### *Rotating Equipment Group*

Deals with equipment with moving parts that transfer energy to fluids. It might be subdivided into Pumps comprised of Dynamic (centrifuge and special effect) and Positive Displacement (reciprocating and rotary), Compressors including Dynamic (centrifuge and axial) and Positive Displacement (reciprocating and rotary) and Turbines (integrated, steam and gas).

#### *Material Handling Group*

Deals with equipment with moving parts that transport solids. It comprises Conveyors (belt, screw, buckets), Heavy Duty Equipment (crushers, pelletisers, heavy screeners, grinders) and Loaders (stackers, reclaimers and ship loaders).

#### *Packaged Equipment Group*

Equipment with larger scope containing work from other Disciplines. Process license scope, cable and conduits, motors, instrumentation, PLCs, skids, valves, specialty items and piping. Packaged Equipment can comprise Thermal Equipment (boilers, flares, heaters, furnaces), Stationary Equipment (treaters, separators, filter trains, chemical injection) and Rotating Equipment. Rotating Equipment packages though are usually part of the Rotating Equipment Group.

The following list of deliverables addresses Project Cycles for greenfield (brand new) facilities not for brownfield work. Every Group should accomplish the following milestones:

#### *Engineering Deliverables*

- *Preliminary Design of Equipment.* Weights for transportation and logistics planning, for structural design, for constructability assessment and for adjustment of cost estimates.
- *Completion of Equipment List.*

After the planning Phase, the Equipment List is completed with mechanical information and becomes the responsibility of the List.

- *P&IDs review.* Input by the Mechanical Discipline for the system design and retrieve information for the preparation of data sheets.
- *Preparation of Mechanical Equipment Data Sheets.* Issued with information from P&IDs and additional input from the Process, Electrical and Materials Disciplines.
- *Issue of Specifications.* Compile or complete those existing ones from the Client and prepare those non-existing ones based on applicable regulations, industrial standards, codes, best practices and lessons learnt.

#### *Procurement Support*

- *ITB Technical Packages for Vendors.* Known as well as MRQs, include the list of equipment to fabricate per vendor, scope description, surveillance requirements, list of specifications and data sheets, and VDDR.
- *ITB Technical Packages for Contractors.* Usually, CRQs same as for vendors but deals with equipment that are field fabricated such as large tanks, spheres, cooling towers or furnaces.
- *TBE and Recommendation Report.* Once the offers from bidders are received, they are evaluated. A report is issued recommending those technically acceptable.
- *Purchase Orders and Contract Assignment Support.* The MRQ/CRQ becomes a MRP/CRP, a contract, to award those vendors and contractors selected as providers.
- *Providers Documentation and Drawings Review.* Engineering and QA/QC documentation in the VDDR are reviewed to confirm compliance with the claims of the contract.
- *Final Acceptance Approval for Release.* Once the procured item is fabricated and ready to go, the SCM ask for release approval after the scope has been completed under the agreed terms.

## Construction Assistance

- *Field Engineering and Installation.* Members of the Mechanical Group might be transferred to the Construction Team to provide support in construction and commissioning.
- *Responses to RFIs.* Questions from construction (and from vendors as well) might be brought up for clarification in equipment fabrication, testing, inspection and installation.
- *Support to Commissioning.* Members of the Mechanical Group provide input regarding the operation and start-up of equipment based on experience or vendor information.
- *MRBs and O&M Review.* This documentation supports the Mechanical Completion and Commissioning of the Project. The review is verifying everything is in order for that.

## Others Activities

- *Project Planning.* Assistance on the preparation of Work

Breakdown Structure (WBS), List of Deliverables and Activities, Scheduling, and Project Control reports.

- *Construction Work Packages (CWP).* Input in relation to Equipment Installation. The CWP is issued by the Piping Mechanical Engineering Group.
- *Input to the other Discipline Deliverables.* Review other Discipline's documentation and drawings for quality control purpose in the interphase with them (pump power, foundation layouts, instrument connections, etc).
- *Cost Control.* Provide information to Cost and Finances Group with updates about the scope changes of all equipment.
- *Management.* Mechanical Discipline requires its own organigram led by the Mechanical Team Lead or Manager to organize the Group hence, attain the goals as planned in the Project work scope, schedule and cost structure.

## Material and Contract Requisitions.

Procurement is an important scope for the Mechanical Discipline. Every deliverable, activity and support the Discipline does turns around the procurement side of the project. The data sheets, specifications and requisitions are classified by the specific type, materials, installed capacity of available providers and technology of the equipment being procured, fabricated and installed.

In large EPCs that classification can be visualized in the table below. That classification can be as detailed as desired with the caveat that too much classification can create more difficulty in controlling the managing and cost of the requisitions.

The classification below pretends to provide just a sample of how that classification can be done. The classification was based on American Industry Standards though it can also be done considering other industrial standards from other countries such as JIS, BS, CSA or DIN.

Engineering	Discipline	Group	Sub-Group	Specialty	Sub-specialty
Mechanical	Mechanical	Static	Storage	Tank	Field Erected (API 650) Field Erected (API 620) Shop Fab (API 650 J)
				Silos	Welded construction Bolted construction
				Hoppers	
			Pressure	Vessels	Carbon Steel Stainless, Low Alloy and Special Materials Cladded
				Large Vessels	Shop Fab Field Erected
				Heavy Wall	Heavy Wall
				Special	Deaerator, others
				Shell and Tube	Carbon Steel Stainless, Low Alloy and Special Materials Cladded
			Heat Transfer	Plate and Frame	CS, SS, AS, other materials
				Hairpin	CS, SS, AS, other materials
				Air Coolers	API special designs, etc
				Special	Spiral, monoblock, others
		Rotating	Pump	Centrifuge	Vendor Standard API Pumps ASME Pumps Low flow/High Pressure, others
				Positive Displacement	Diaphragm Lobules Plunger Screw
				Centrifuge	Service Air Gas, etc.
				Reciprocating	Plunger Screw, others
				Package	Compressor, pump or generator integrated
			Turbine	Prime mover	Steam Gas, others
		Packages	Stationary	Boilers	Fire-tube Water-Tube Heat Recovery Steam Generator Once-Through Steam Generator
				Flare	Low-pressure High-pressure
				Heater	Gas Heater Oil Heater Special Heaters
				Cooling Tower	Field Erected
				Treater	Electric Hydrocarbon
		Material Handling	Conveyors	Belt	Open or Closed belt
				Screw	Screw
				Buckets	Buckets
			Loaders	Ship Loaders	Luffin and slewing, telescopic, circular, stationary
				Reclaimers	Underground, portal, side, bridge
				Stackers	Luffin and slewing, boom, radial, overhead
			Heavy Duty	Pelletizers	Sulfur, minerals, others
				Screeners	Sieve, statics, panels, rail, basket, interstage
				Crushers	Impact, jaw, basket, etc
				Grinders	Ball mills, cylinder mills
			Others	Others	Diverter, rotary valves, blade gates, etc.
	Piping				Part II
	MEP				Part III

## Glosary.

CWP: Construction Work Package

EPC: Engineering, Procurement and Construction

MEP: Mechanical, Electric and Plumbing Systems.

ITB: Invitation to Bid

LLI: Long Lead Item

MRQ/MRP: Material Requisition Quotation/Purchase Order

CRQ/CRP: Contract Requisition Quotation/Purchase Order

O&M: Operation and Maintenance Manual.

PMT: Project Management Team

RFI: Request for Information

SCM: Supply Chain Management

VDDR: Vendor Drawing and Data Requirements

WBS: Work Breakdown Structure



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## David Amesty Profile

David has worked for more than 20 years in the hydrocarbon processing Industry including refineries, crude oil and gas processing, heavy oil upgraders and SAGDs, pipelines, tank farms and terminals, compression stations and petrochemicals.

With experience in energy ancillary systems, piping, heavy equipment and machinery, he has performed roles as Mechanical Engineering Lead and Principal Mechanical Engineer in important EPC Turnkey Projects in Venezuela, Ecuador and Canada.

He also holds a BSc degree in Mechanical Engineering from the Central University of Venezuela pursuing a Master Degree in Engineering Management in the Ohio University, US. David is Professional Engineer for the Provinces of Alberta and Saskatchewan in Canada



## EMPLOYEE PROFILE



**Nelson Rafael Bermejo,  
Senior Petroleum Engineer**

Integration, Well Integrity and Asset Management, Enhanced oil/gas recovery (EOR), Drilling and Production Optimization Hydrocarbons and experienced in the use of a myriad of specialized Production Reservoir Management Software applications.

Over the years, Mr. Bermejo has added the following achievements to his career –

- Developed Reservoir Management Plan (Central Lake, Venezuela) to achieve 12,5000 bopd using acid fract without any accidents.
- Improved production in Heavy Oil Field in Venezuela by optimizing sucker rod pumps, ESP and PCP using DOF technology.
- Ad Honorem Teacher at Chemistry Faculty in the

Western part of Venezuela

- Introduced new stimulation design on Dukhan Field (Qatar) to improve production per individual well.
- Tested new stimulation fluids (Chelate) in Qatar Field avoiding flaring low corrosion and pollution.
- Introduced new GL design and 'best practices' on Qatar Field wells by installing a new mandrel at high degree inclination.
- Designed / Recommended Phase II for QP-Total Acid Stimulation Project to optimize well stimulation in Qatar
- Managed voice communications QP Technical committed in Qatar, resulting in new products to be used in stimulation design for limestones rock and generation of an excess production
- Development Plan included Reserves Analysis for Mexico Field, 50 MM\$ Capital Project.
- Participated as delegate in tender committed on the Shell GTL Project.
- Developed Waterflood Project in Ecuador, 70 MM \$ Capital Project.

Since the nineties, Mr. Bermejo has worked in various multicultural asset team environments working in Venezuela, USA, Mexico, Qatar, Ecuador and now Libya where he is currently employed in the Sirte Oil Company as a Senior Petroleum Engineer. "My experience with AOS has been excellent with exceptional support being provided by the various departments within Amazon, providing support with our travel and visa requirements, medical issues and general administrative requirements all being provided in a helpful and friendly manner."

# The importance of Communication

- By Mr Essa Matoug

Communication is one of the most vital aspect in any operations, whether small or big ones, as it allows better coordination between every stakeholder in the Company, be it out in the fields or within the confines of the offices. Due to the nature of its operations, and given the geographical position of its presence throughout Libya, Sirte Oil Company (SOC) has always been faced with the enormous task of keeping everybody connected day and night, 24 x 7.

While the main SOC refinery is located in Marsa El Brega, its drilling basin stretches all the way to 200 KM to the south and its gas pipeline goes all the way from Benghazi in the East, to Mellitah in the West, passing through and providing gas supply to some of the major cities in the Country. The challenge of providing interconnections to all the remote sites is not limited to the voice communication aspect, but more so with the transfer of daily operational data and data communication, e.g. SCADA, Security, Ethernet, etc.

Throughout the 80's and the 90's, SOC has employed a 34MBps Plesiochronous Digital Hierarchy (PDH) backbone transmitted through Microwave Radios to service the telecommunication

requirements of its oil and gas fields. While this system served its purpose during those times, its inherent limitations and the ever-rapid developments in the field of Information and Communication Technology (ICT) has rendered this system obsolete by the early 21<sup>st</sup> Century.

Some of the most obvious drawbacks of the PDH technology, as far as SOC operation is concerned are as follows:

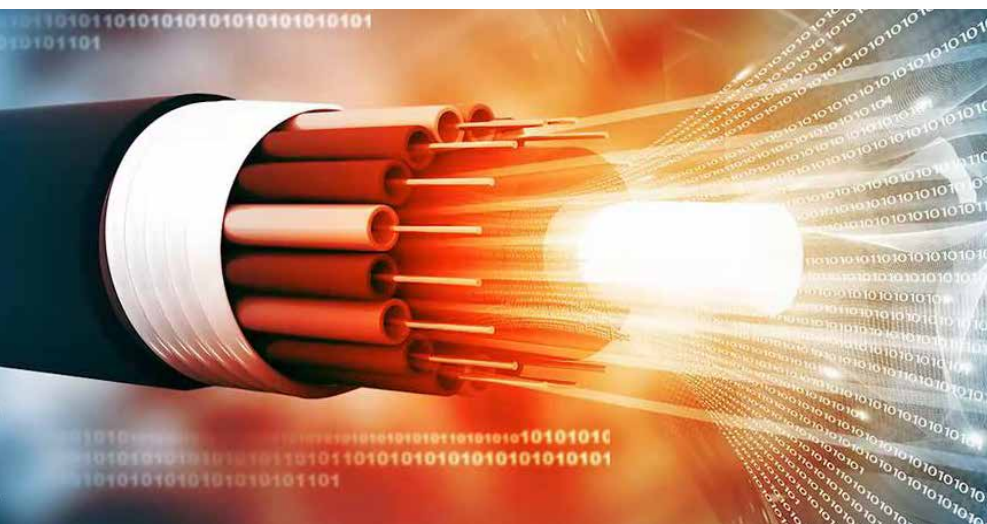
1. **Limited bandwidth** – The PDH system deployed by SOC can only provide up to a maximum of 34MBps of bandwidth which, when broken down, would only translate to 16 x E1 G.703 lines. This capacity mostly served to connect the voice requirement of the Company, with very minimal space available for data transmissions. The emergence of new data transmission technique for SCADA and Security Systems in the late 90's, i.e. from Serial to Ethernet, has further squeezed the available space within the Company's Telecommunication Network.

2. **Unreliable transmission media and topology** – It is a given that atmospheric conditions above the Libyan Dessert is quite unpredictable and would obviously

affect any system that relies on the atmosphere for its transmission media. Although SOC has implemented strategies (diversity) to somehow mitigate the effects of the wild changes in the atmospheric conditions, it was somehow insufficient against the effects of fading. The worst part is, PDH only allows Point-to-Point (PtP) connections between sites with the whole bandwidth needing to be demultiplexed first in order to access/extract lower tributaries (interfaces). If one hop within the multi-hop linear topology goes down, the entire network behind it will become inaccessible.

3. **Lack of remote management capability** – One of the most important requirement in the maintenance of systems that are spread over a wide geographical area is the ability to remotely monitor and administer each equipment from a centralized location as it allows the immediate diagnosis, analysis and possible resolution of technical issues, minimizing system downtime and the need to deploy personnel to the site even on minor problems. Unfortunately, remote management is a form of data transmission and would further eat up the available bandwidth in the network if implemented fully. As such, it appears that this feature was not given much consideration in the design of PDH systems.

By the early 2000s the gas pipeline to Benghazi was laid out and with it came the first version of SOC's Synchronous Digital Hierarchy (SDH) system, the STM-1 (155MBps). This ushered in a new era in the Company's Telecommunication Network as it offered all the capacity required by the operations at that time while addressing a lot of the disadvantages presented by the previous PDH network.





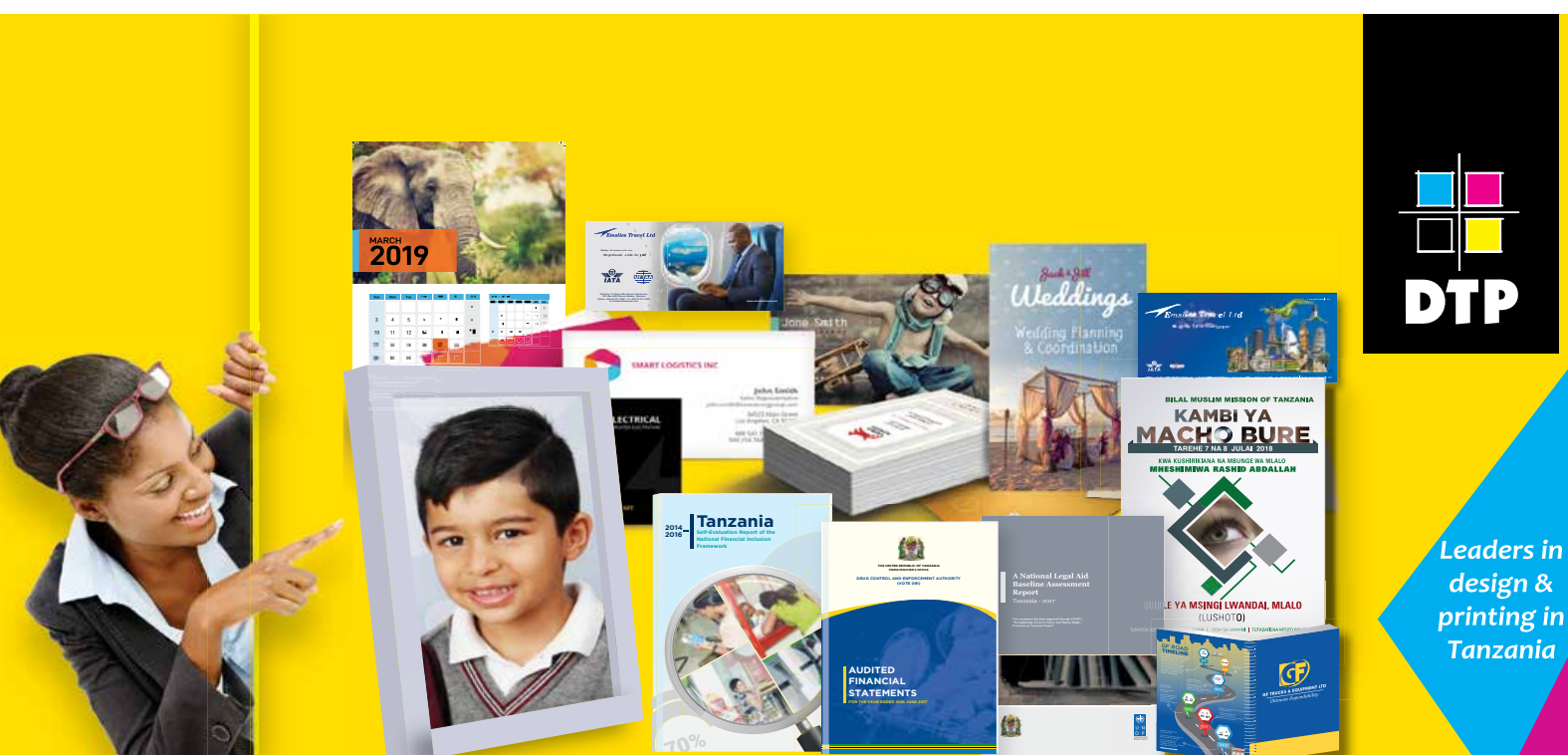
But as the saying goes, “With great power comes great responsibilities”. As news broke out of the increased network capacity of its network, SOC started receiving request from various Companies, both private and state-owned, to use a portion of the bandwidth for their own telecommunication requirements. Waha and Agoco Oil Companies needed to connect their drilling fields in the south to their main offices and had asked to use the SOC network to minimize the need for the establishments of new communication infrastructures. Libyana and Madar started installing GSM Base Stations in the Company’s oil and gas fields, as well as in nearby towns with the condition that SOC is going to provide the required link to connect the base stations

to the main GSM exchange. So now the domino effect comes in. New services and technologies require an increase in bandwidth. Increased bandwidth necessitates the addition of new services to maximize the network. And now you require even more bandwidth for even more services.

By the late 2000s, the need for additional network capacity had become more obvious and necessitated the upgrade of the STM-1 network to STM-4 (622Mbps). Instead of totally decommissioning the previous STM-1 network in the fields, SOC decided to operate the new network in parallel with the old one, where all low-bandwidth services, i.e. voice, serial, etc., were kept in the old system, while all high-bandwidth services, i.e.

E1, Eth, etc., were transferred to the new system. To augment this capacity increase in the fields, a new STM-16 (2.5GBps) network was also established in the gas pipeline to Benghazi right after the Libyan Civil War, to work in parallel with the previous STM-1 network.

Now, as always, new technologies have been emerging well into the 21<sup>st</sup> Century, which will require even more additional capacity to the network. SOC is not one to rest on its laurels and have already made steps to cope with this expected increase. The Company is now awaiting the acquisition and delivery of the latest STM-64 (10GBps) system to bolster its current network and provide an even better service to all its employees



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