

Jabel Oil Services (JOS)

شركة الجبل للخدمات النفطية

JABEL OIL SERVICES (JOS) IS AN ESTABLISHED **LEADER** IN LIBYAN OILFIELD INDUSTRY



Training Services



Construction Services



Material Procurement



Design & Engineering



Maintenance Services



Manpower Supply



Catering Services



Since two decades **Jabel Oil Services** is an established leader in the Libyan Oil & Gas Industries; because it is highly focused on delivering and developing premium quality services and projects.

JOS is your reliable partner for Oil & Gas Projects



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**AN ESTABLISHED LEADER
IN LIBYAN OIL & GAS
INDUSTRIES**

**Tel: +218 21-483-0594
Fax: +218 21-484-3226**

www.joslibya.com





Since its establishment, JOS has successfully completed 40+ Projects in Libyan Oil & Gas Industries

EXECUTIVE SUMMARY



Jabel Oil Services (JOS) takes the opportunity to extend our greetings to all your good selves and to express our best wishes for the success of your operation in LIBYA. Jabel Oil Services (JOS) is a private Libyan Company established almost twenty (20) years ago whose primary aim is to engage in Engineering, Construction, Technical Manpower Services, Maintenance & Repair in Oil Refineries, Storage Facilities and Petrochemical Plants. Our company intends to provide oil field support and services to the national and international Oil Companies in exploration and production activities.

The company started with the philosophy of starting and completing the projects in accordance with International Standards & Specifications to the satisfaction of our valued clients. This philosophy has been maintained since the establishment of the company that earned for itself the trust and confidence of our clients.

To maintain credibility and trust with our clients, we engaged the services of our fully experienced Engineers, Supervisors and Craftsmen who will ensure the highest standards of performance in every aspect of our project and maintain work quality in accordance with international Standards and practices. We are greatly proud of presenting our prequalification statements and we hope that we could establish with our good selves a better working relations and cooperation in the near future.





MESSAGE FROM CHARIMAN



Diversity for growth and innovation is one of JOS's values and part of our business strategy. We know that understanding and drawing on the strength of diversity means meeting the needs of clients around Libya, building strong relationships in many sectors we serve, and fully engaging the talents of our people. Or simply put, making the most of our diversity has always been the right thing to do and the smart thing to do.

We recognize the value and power of tapping into the full spectrum of ideas and abilities that people possess. Doing just that has been a strong part of past success and is crucial for seizing the opportunities ahead. We are competing in a dynamic marketplace, and we know that our growth will depend on an increasingly diverse and global workforce. Our strength comes from the combination of what we have in common, like our shared values, vision and purpose, as well as what makes us different, like experiences and perspectives.

We grow as an organization and as people when we encourage different viewpoints and ways of thinking – differences that come through diversity. That is what leads to true insights and innovative practices.

Supporting diversity for growth and innovation is a long term journey. We have seen rewards for our efforts so far and look forward to doing more – to helping create better futures for employees, our business and our communities.

Ragab el borgi
Chairman - JOS
JABEL OIL SERVICES



JOS is focused on achieving excellence in
Operations Management

About us



JOS does not compromise when it comes to delivering Quality to its clients...

GENERAL INFORMATION ABOUT JOS

We are an established company in the Libyan Oil & Gas Industries



CALL US TODAY FOR ANY BUSINESS ENQUIRY
+218 (91) 376-6200

Official Name:	Jabel Oil Services	
Nationality	Libyan	
Registration No. :	65505	
Registration Date:	02 November 2006	
Website:	www.joslibya.com	
Email Address:	info@joslibya.com	
Chairman / General Manager:	Mr. Rajab El Borgi (elborgi@joslibya.com)	
Executive Manager:	Mr. Wahid Bassili (bassili@joslibya.com)	
Number of Employees:	750+ from 20+ Countries	
Equipment:	200+	
Oilfields:	6	
Tripoli Branch		Benghazi Branch
Telephone No. :	+218 21-483-0594 +218 21-484-3226	
Fax No.:	+218-21-361-3798	+218-61-224-1340
Address:	P. O. Box 70843, Seyahia District, Tripoli - Libya.	



OUR STRATEGIC STATEMENTS

STRATEGIC VISION

You Dream We Build, Operate and Maintain. We envision Jabel Oil Services to expand capabilities in Engineering, Procurement, Construction, Operation and Maintenance worldwide. If it has to be built, operated, and maintained, we at Jabel Oil Services will work it for you.

STRATEGIC MISSION

Jabel Oil Services (JOS) is the World Partner in Engineering, Procurement, Construction, Operation and Maintenance. On our mission, Jabel Oil Services searched people worldwide to provide clients with experienced specialists. Jabel Oil Services ensure that workers perform at highest industrial safety and quality standards.

STRATEGIC VALUES

We value the philosophy of starting and completing projects on time and on budget with highest standards in safety and quality for the satisfaction of our valued clients.





JOS IS EMPOWERED BY A TALENTED GLOBAL WORKFORCE

OUR GLOBAL WORKFORCE

JOS has established a proven “Organizational Culture” which helps to utilize diversity and talent, brought by a Global Workforce from around the world...



Our Source of Competitive Advantage

Our Global Workforce helps us to bring together and utilize professional knowledge that is brought from more than 25 countries around the world...



OUR PERMANENT MACHINERY & EQUIPMENT

JOS has established a proven “Organizational Culture” which helps to utilize diversity and talent, brought by a Global Workforce from around the world...



General Manager	1
Executive Manager	1
Administration Manager	1
Operation Manager	1
A/C Technician	16
Accountant	2
Administration Staff	8
Assistant Cook	6
Asst. Camp Boss	6
Auto Denter	2
Auto Electrician	4
Backhoe Operator	11
Boom truck Operator	15
Bus Driver	6
Cable shop Electrician	3

Cable Splicer	2
Camp boss	6
Camp maintenance	6
Car Painter	1
Carpenter	10
Civil Engineer	3
Civil Inspector	2
Cleaner	2
CNC Operator	1
Comm Technician	9
Construction Manager	1
Cook	7
Crane Operator	9
Diesel Mechanic	6
Doc Controller	9

Doctor	1
Driver	43
Electrical Engineer	3
Electrical Technician	35
Environmental specialist	6
Fire Alarm Technician	2
Fire Commander	2
Fire Engineer	2
Fire Safety Specialist	2
Fireman	35
Foreman Lineman	10
Foreman Welder	20
Gas Mechanic	10
H.E. Mechanic	26
Head of Travel Department	1



OUR PERMANENT MACHINERY & EQUIPMENT

JOS's success is based on carefully crafted vision, values, norms, systems, symbols, language, assumptions, beliefs and habits that defines its success.



HSE Drilling Advisor	4
HSE Specialist	5
HSEMS Advisor	4
HSEMS Coordinator	2
Instrument Inspector	3
Instrument Technician	16
Laborer	10
Land Surveyor	3
Lineman	52
Mason	3
Material Controller	2
Material Specialist	2
Mechanical Engineer	3
Mechanical Specialist	1
Nurse	3

Painter	10
Photocopy Technician	1
Pipe Welder	80
Pipefitter	90
Piping Engineer	5
Piping Supervisor	5
Plate Welder	10
Plumber	6
Project Engineer	3
Purchaser	2
Rotating Mechanic	11
Safety Engineer	2
Safety Officer	6
Safety Specialist	3
Security	12

Skilled Labor	11
Sr. Civil Inspector	2
Sr. Diesel Mechanic	2
Sr. Environmental Advisor	2
Sr. Instrument Technician	1
Storekeeper	6
Tank & Vessel Inspector	1
Tea boy	2
Technical Manager	1
Timesheet Coordinator	1
Tower Rigger	1
Training coordinator	2
Welding Foreman	6
Welding Technician	1
Total	753



**WE RELY ON TECHNOLOGY
THAT MAKES DIFFERENCE**



OUR PERMANENT MACHINERY & EQUIPMENT

JOS uses state-of-the-art technologies to accomplish its operational objectives

Equipment or Machinery Type	Type	Quantity
Doosan DX140W	Loader	2
Tadano 55 ton	Crane	3
Tadano 250 ton	Crane	1
Hidromek HMK 102B	Backhoe/Loader	9
Hidromek HMK 102S	Backhoe/Loader	4
Doosan Mega 300-V	Forklift	5
Caterpillar 950B	Forklift	3
Daewoo Tata Model K6D6F	Truck	2
Hino GT1JHUA CWC	Boom Truck	16
IVECO ASTRA300	Boom Truck	17
Hino GT1JHUA CWC	Mobile Workshop	2
Mitsubishi Eagle	Bus	5
Hino 4*4	Bus	1
Mercedes Benz	Bus	1
Toyota Coaster	Mini-Bus	2
Mitsubishi Rosa	Mini-Bus	1
Hyundai H1	Mini-Bus	1

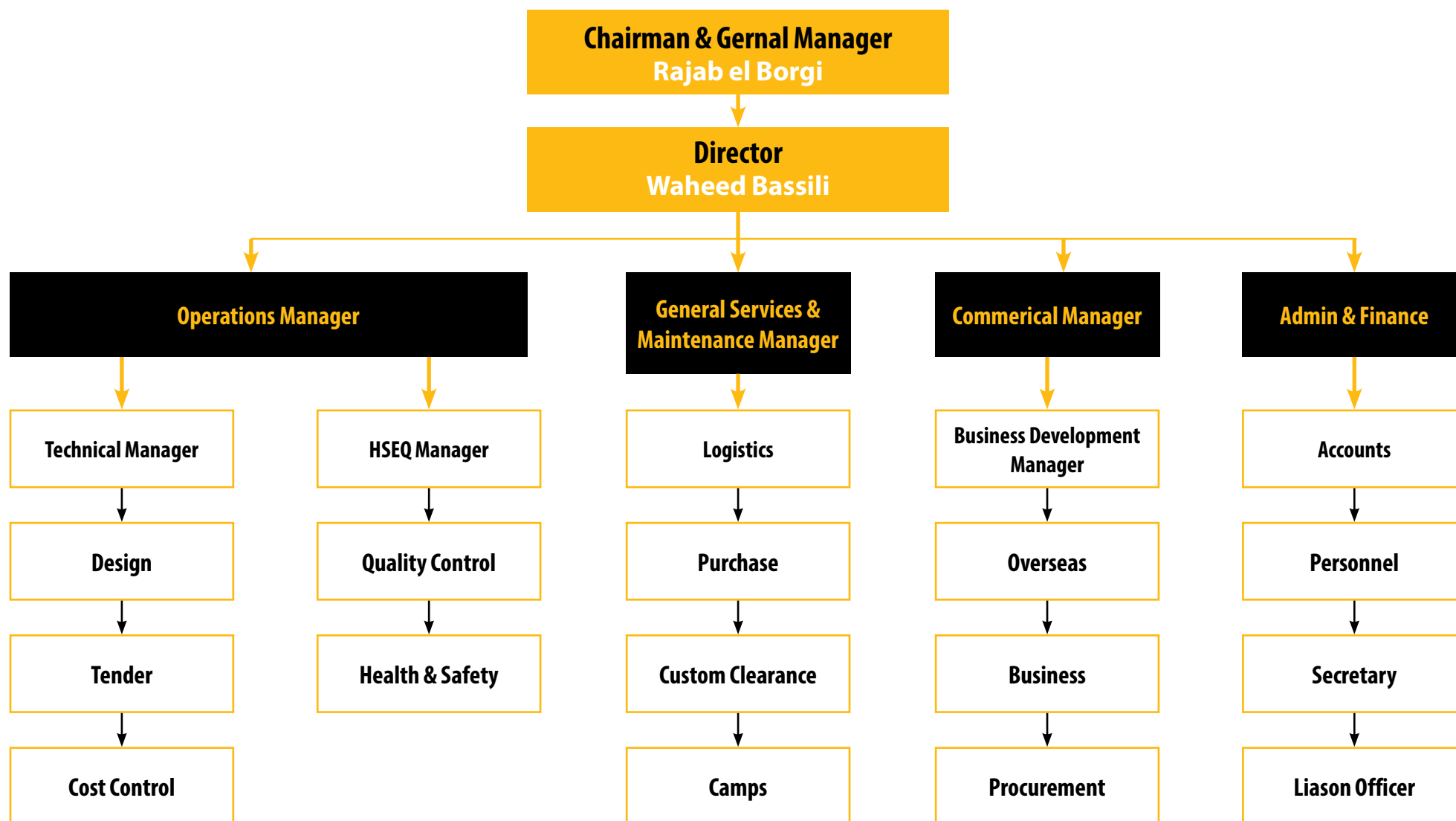
Equipment or Machinery Type	Type	Quantity
Mercedes Benz VITO	Mini-Bus	1
Toyota Land Cruiser	Crew Cab	35
Toyota Land Cruiser	Pick Up	12
Toyota HILUX	Pick Up	10
Toyota Pickup Land Cruiser	Welding Rig	35
Toyota Land Cruiser	Saloon	3
Lincoln Electric SAE 400	Welding Machine	35
Miller	Welding Machine	10
Deutz	Welding Machine	2
Bobcat	Loader	3
Caterpillar 950B	Loader	2
Caterpillar 956	Loader	2
Caterpillar 920	Loader	3
Caterpillar 12M	Grader	1
12000 Liter	Water Tank	2
Mercedes Benz	Carrying Truck	3
Mercedes Benz	Concrete Mixer	2



JOS IS A QUALITY-ORIENTED ORGANIZATION



ORGANIZATIONAL CHART OF JABEL OIL SERVICES



**OIL RESERVES IN LIBYA ARE THE LARGEST IN
AFRICA AND THE 5TH LARGEST IN THE WORLD**

About Libya





Libya is considered a highly attractive oil area due to its low cost of oil production (as low as \$1 per barrel at some fields), and proximity to European markets.

GEOGRAPHY OF LIBYA

GEOGRAPHY OF LIBYA



Libya is fourth in size among the countries of Africa and seventeenth among the countries of the world. Its coastline lies between Egypt and Tunisia. Although the oil discoveries of the 1960s have brought it immense petroleum wealth, at the time of its independence it was an extremely poor desert state whose only important physical asset appeared to be its strategic location at the midpoint of Africa's northern rim. It lay within easy reach of the major European nations and linked the Arab countries of North Africa with those of the Middle East, facts that throughout history had made its urban centres bustling crossroads rather than isolated backwaters without external social influences. Consequently, an immense social gap developed between the cities, cosmopolitan and peopled largely by foreigners, and the desert hinterland, where tribal chieftains ruled in isolation and where social change was minimal.



The Mediterranean coast and the Sahara Desert are the country's most prominent natural features. There are several highlands but no true mountain ranges except in the largely empty southern desert near the Chadian border, where the Tibesti Massif rises to over 2,200 metres. A relatively narrow coastal strip and highland steppes immediately south of it are the most productive agricultural regions. Still farther south a pastoral zone of sparse grassland gives way to the vast Sahara Desert, a barren wasteland of rocky plateaus and sand. It supports minimal human habitation, and agriculture is possible only in a few scattered oases. Between the productive lowland agricultural zones lies the Gulf of Sidra, where along the coast a stretch of 500 km of wasteland desert extends northward to the sea. This barren zone, known as the Sirtica, has great historical significance. To its west, the area known as Tripolitania has characteristics and a history similar to those of nearby Tunisia, Algeria, and Morocco. It is considered with these states to constitute a supranational region called the Maghrib. To the east, the area known historically as Cyrenaica has been closely associated with the Arab states of the Middle East. In this sense, the Sirtica marks the dividing point between the Maghrib and the Mashriq.

GEOGRAPHY OF LIBYA



Along the shore of Tripolitania for more than 300 km, coastal oases alternate with sandy areas and lagoons. Inland from these lies the Jifarah Plain, a triangular area of some 15,000 square km. About 120 km inland the plain terminates in an escarpment that rises to form the Nafusa Mountains, with elevations of up to 1,000 metres, which is the northern edge of the Tripolitanian Plateau. In Cyrenaica there are fewer coastal oases, and the Marj Plain – the lowland area corresponding to the Jifarah Plain of Tripolitania – covers a much smaller area. The lowlands form a crescent about 210 km long between Benghazi

and Derna and extend inland a maximum of 50 km. Elsewhere along the Cyrenaican coast, the precipice of an arid plateau reaches to the sea. Behind the Marj Plain, the terrain rises abruptly to form Jabal al Akhdar (Green Mountain), so called because of its leafy cover of pine, juniper, cypress, and wild olive. It is a limestone plateau with maximum altitudes of about 900 metres. From Jabal al Akhdar, Cyrenaica extends southward across a barren grazing belt that gives way to the Sahara Desert, which extends still farther southwest across the Chadian frontier. Unlike Cyrenaica, Tripolitania does not extend

southward into the desert. The southwestern desert, known as Fezzan, was administered separately during both the Italian regime and the federal period of the Libyan monarchy. In 1969 the revolutionary government officially changed the regional designation of Tripolitania to Western Libya, of Cyrenaica to Eastern Libya, and of Fezzan to Southern Libya; however, the old names were intimately associated with the history of the area, and during the 1970s they continued to be used frequently. Cyrenaica comprises 51%, Fezzan 33%, and Tripolitania 16% of the country's area.



OIL RESERVES IN LIBYA

OIL RESERVES IN LIBYA



Libya is a member of the Organization of the Petroleum Exporting Countries, the holder of Africa's largest proved oil reserves, and an important contributor to the global supply of light, sweet crude oil. It is believed to hold large amounts of untapped hydrocarbon resources as it shares similar hydrocarbon-bearing geological structures with its neighboring countries although most of the country remains unexplored. Oil reserves in Libya are the largest in Africa and the fifth largest in the world with 76.4 billion barrels ($12.15 \times 10^9 \text{ m}^3$) as of 2010. Oil production was 3.1 million barrels per day ($490 \times 10^3 \text{ m}^3/\text{d}$) as of 2010, giving Libya 77 years of reserves at current production rates if no new reserves were to be found.



Libya is considered a highly attractive oil area due to its low cost of oil production (as low as \$1 per barrel at some fields), and proximity to European markets. Libya's challenge is maintaining production at mature fields, while finding and developing new oil fields. Most of Libya remains unexplored as a result of past sanctions and disagreements with foreign oil companies. The majority (85%) of Libyan oil is exported to European markets. 11% or 403 million barrels ($64.1 \times 10^6 \text{ m}^3$) of oil imports to the European union in 2010 came from Libya, making it the third biggest importer behind Norway and Russia.

According to Oil and Gas Journal (OGJ), Libya had proved crude oil reserves of 48 billion barrels as of January 2013– the largest endowment in Africa, accounting for 38% for the continent's total, and the ninth largest amount globally. About 80% of Libya's reserves are located in the Sirte basin, which also accounts for a vast majority of the country's oil output. Libya has six large sedimentary basins– Sirte, Murzuk, Ghadames, Cyrenaica, Kufra, and the offshore, which the government believes has substantial undiscovered potential. Libya could significantly increase its reserves because a majority of the country remains unexplored and it shares similar hydrocarbon-bearing geological structures as its neighboring countries, according to IHS CERA.

OIL RESERVES IN LIBYA



Libya is believed to hold large amounts of untapped hydrocarbon resources as it shares similar hydrocarbon-bearing geological structures with its neighboring countries although most of the country remains unexplored.

Before the 2011 civil war, the NOC claimed that capacity additions of around 775,000 bbl/d were possible from existing oil fields. Libya typically exports most of its crude oil to European countries, with Italy being the leading recipient. The country's National Oil Corporation (NOC) has emphasized the need to apply enhanced oil recovery techniques to increase crude oil production at maturing oil fields.

As with its oil sector, Libya's natural gas industry recovered in 2012, but production still remained below pre-war levels. Libya's rank as a producer and reserve holder is less significant for natural gas than it is for oil. Most of its natural gas production is exported to Italy via pipeline. Libya's natural gas production and exports increased considerably after 2003 with the development of the Western Libya Gas Project and the opening of the Greenstream pipeline to Italy. In 1971, Libya was the third country in the world, after Algeria and the United States (Alaska), to begin exporting liquefied natural gas (LNG). Typically, the country exports a small amount of LNG to Spain.

Libya also produces an estimated 120,000 to 140,000 bbl/d of non-crude liquids, which include condensate and natural gas liquids. These non-crude liquids mainly come from the Mellitah gas processing plant, a gas processing plant at the Intisar complex, and a natural gas liquids plant in Marsa al-Brega.



MAJOR OIL & GAS COMPANIES OPERATING IN LIBYA



NOC
www.noclibya.com.ly



Waha Oil Company
www.wahaoil.com



Sirte Oil Company
www.soc.com.ly



Mabruk Oil Opt. Co.
www.mabrukoil.com



Zueitina Oil Company
www.zueitina.com.ly



Ras-Lanuf Oil & Gas Co.
www.raslanuf.ly



Zawia Oil Refining Co.
www.arc.com.ly



Akakus Oil Operations
www.akakusoil.com



Tatneft
www.tatneft.ru



Teikoku Oil Libya
www.teikokulibya.com



T.P.O.C (Turkish Petroleum)
www.tpao.gov.tr



RWE Dea AG
www.rwe.com



Shell
www.shell.com



Sonatrach
www.sonatrach.com/en/



Stat Oil
www.statoil.com



LIFECO Libya
www.lifeco.ly



Petro Canada
www.petro-canada.ca



Petrobras
www.petrobras.com/en/



Pertamina
www.pertamina.com/en/



Japex
www.japex.co.jp/english/



JX Nippon
www.nex.jx-group.co.jp



Oil India Limited
www.oil-india.com



























ONGC
www.ongcindia.com



Repsol Oil Operations
www.repsol.com



MAJOR OIL & GAS COMPANIES OPERATING IN LIBYA

 <p>ExxonMobil corporate.exxonmobil.com</p>	 <p>GAZPROM www.gazprom.com</p>	 <p>Inpex www.inpex.co.jp/english/</p>	 <p>Amerada Hess Libya www.hess.com</p>	 <p>British Gas www.britishgas.co.uk</p>	 <p>ChevronTexaco www.chevron.com</p>
 <p>CNPC classic.cnpc.com.cn/en</p>	 <p>Polskie LNG S.A. en.polskieng.pl</p>	 <p>T.P.O.C (Turkish Petroleum) www.tpao.gov.tr</p>	 <p>O.M.V / Husky www.omv.com</p>	 <p>REMSA www.repsol.com</p>	 <p>CPC Corporation Taiwan www.en.cpc.com.tw</p>
 <p>Hydro Gas Libya www.oilgaslibya.com</p>	 <p>Total CPTL www.total.com</p>	 <p>OXY www.oxy.com</p>	 <p>Wintershall www.wintershall.com</p>	 <p>TPIC www.tpico.com.tr/en/</p>	 <p>British Petroleum www.bp.com</p>
 <p>Harouge Oil Operations www.harouge.com</p>	 <p>ENI Oil Company www.eni.com</p>	 <p>ENI Gas Company www.eni.com</p>	 <p>AGOCO www.tpao.gov.tr</p>	 <p>Woodside Energy Ltd. www.woodside.com.au</p>	 <p>Verenex Energy Inc. www.verenexenergy.com</p>





Our Services



JOS is focused on achieving and maintaining excellence in Operations Management

JOS IS A FULLY ETHICALLY-ORIENTED COMPANY



TABLE OF CONTENT FOR JOS SERVICES

As a leader in the industry, JOS is focused on providing high-quality, timely and cost-effective services in a safe operating environment. JOS is committed to working with our clients in the industry, while providing its customers total service quality and satisfaction. JOS is a fully ethically-oriented company that will not sacrifice quality, health, safety or environmental principles for commercial profit or equipment availability.

Due to nature of its diverse business activities, JOS Board Members have decided to let each Business Unit or Department operate under its own custom tailored Strategies and mechanisms to meet growing demands in the industry and related market segments while achieving overall organization's strategic objectives.

JOS is currently focused in executing its operations or services in following business sectors / markets:

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Training Services

TRAINING SERVICES FOR OIL & GAS INDUSTRIES

Our vision

JOS's Training department's vision is to be a regional leader in providing professional training and development courses for Oil & Gas Industries.

Our Mission

JOS's mission is to build competent professionals for Oil & Gas Industries by delivering learning and development base on industrial proven experience and contemporary knowledge.

Our Objectives

JOS considers sale as the essential component for the success of our company, that's why we define our objectives to achieve our strategic goals by:

- To ensure that the skills, ability and potential of all our trainers developed and up to date.
- To continually improve the quality of human resources through continuous training & development based on industry proven experience and contemporary knowledge to support Oil & Gas industries.
- To support our staff to develop their skills and abilities and reach their potential and in doing so improve the effectiveness of the organization and the quality of the service we provide.

Overview

From processing to pipeline, engineering to operations, JOS has proven industry experience to help manage the talent required to execute on your midstream assets. As a trusted advisor and emerging leader in the industry, we can help you tackle your operational challenges by improving your workforce. JOS can provide the highest quality, business relevant programs that span all technical processes, and give management assurance that they have the skilled people they need to maximize asset value. It offer added value to employees via new, broad-reaching courses that fill gaps, and deliver the ability to perform and be able to prove it. JOS has processes, tools, and people to create a holistic workforce development plan for your engineers, operators, and technicians. It offers industry approved

course material delivered through instructor led training modules. with a strong and proven petroleum industry's knowledge our experts will work with you to develop structured accelerated learning programs for your organization.

JOS is willing to provide broader, deeper and more flexible solutions in the development and assurance of competent personnel. JOS has affiliations with leading Training & Development Services providers in the industry. It can offer broad range of professional courses tailored for petroleum industry professionals. Proceeding pages provide summarized details of wide range of some training courses which JOS can offer to improve productivity of your organization by improving your professional workforce. Based on industry's growing needs, JOS can offer new courses or custom tailored solutions for your specific professional needs.

JOS offers training for 5-15 participants per training course in English Language. Training duration of our courses is between durations of 16, 26, 39 and 52 weeks.



CATEGORIES OF TRAINING COURSES



Management Skills

33



Project Management

35



Petroleum Industry

39



Operations

46



Process Facilities

51



Gas Processing

54



Drilling

56



Mechanical

64



Production

66



Instrumentation & Electrical

70



HSEQ

72



Accelerated Courses

76



01 - MANAGEMENT SKILLS

Essential Leadership Skills for Technical Professionals

Basic Level (16 Weeks Duration)

Description

In the oil and gas industry, skillful and competent leadership is extremely important for safety, productivity and asset management. The 21st century brings new emphasis on leaders, new communication technologies, increased focus on safety, information overload, workforce dynamics, asset integrity and many other concerns which challenge even the most proficient leader/manager. This course will help you unleash natural motivation in your team. Your stress level can be lowered by working more efficiently and effectively by tapping the emotional intelligence of your team and co-workers.

Who Should Attend

Supervisors, Team Leads, Managers and others interested in becoming a better leader and a contributing team member will greatly benefit from this one week experience.

Essential Technical Writing Skills

Basic Level (16 Weeks Duration)

Description

Writing for work-related purposes ought to be brief, clear, informative and above all, readable. In this practical hands-on course, you gain a solid foundation in technical writing skills.

Who Should Attend

All engineers, managers, IT/computer support staff, team leaders, supervisors and individuals responsible for writing

letters, memos, reports, procedures, test results, and proposals that are clear, concise, and professional.

Negotiating Skills for the Petroleum Industry

Basic Level (16 Weeks Duration)

Description

This course helps you to develop strong interpersonal skills in the art and science of negotiation. You will learn to apply these skills to complex organizational issues and individual needs. Various tools and techniques are used to negotiate differences and disagreements to produce positive results.

Who Should Attend

Petroleum industry personnel who are responsible for negotiating the best possible terms of an agreement in public and private sectors and those negotiating resources and deliverables in projects and programs.

Team Building for Intact Teams

Basic Level (16 Weeks Duration)

Description

This course is most effective when attended by an entire team. Team members will develop and refine the skills essential for high performance teams. Emphasis is placed on learning more effective ways to enhance total team functionality and maximum team productivity. Individual communication styles will be assessed and examined to identify the most appropriate uses of team strengths. This course has been constructed to maximize opportunity for

intact teams to strengthen team performance and team productivity.

Who Should Attend

Any intact team interested in becoming a stronger and more productive team such as project teams, leadership teams, cross-functional teams, production teams, quality improvement teams, etc.

Team Leadership

Basic Level (16 Weeks Duration)

Description

This program will develop and refine the skills essential for leading a high performance team. Emphasis is placed on the leader's role in effectively enhancing total team functionality and maximum team productivity. Individual communication styles will be assessed and examined to identify the most appropriate communication style to use with your team. This will be an active experience. In addition to receiving individual assessment information, participants will be exposed to team concepts, theories and skill development through various methods.

Who Should Attend

Team leaders, supervisors, managers and others responsible for leading a team.



01 - MANAGEMENT SKILLS



Presentation Skills for Petroleum Industry

Basic Level (16 Weeks Duration)

Description

Technical personnel often find it difficult to clearly express thoughts and ideas to others, especially when asked to report findings to - or request project expenditure authorization from - senior management. This course is for individuals who are required, as part of their jobs, to make presentations in-house or in public, and who need, therefore, to perfect the fundamentals of dynamic presentation-making.

Who Should Attend

Industry personnel who wish to acquire the skills and techniques needed to design and deliver technical material clearly and confidently.

Making Change Happen: People and Process

Basic Level (16 Weeks Duration)

Description

Attendees will work in teams to overcome the problems encountered when making changes in their organizations. You will also learn how to develop the ability to effectively handle organizational changes by examining the eight-step change process and understanding your own, and others, needs and responses to each step in the change process. A group workshop allows attendees to engage in, comment on, and improve their competencies in managing change.

Who Should Attend

All managers, team leaders, supervisors and individuals responsible for ensuring change is implemented properly.

Meeting Management and Facilitation for the Petroleum Industry

Basic Level (16 Weeks Duration)

Description

Meetings remain a boon or curse to corporate communication. Properly planned and managed, meetings are extremely positive and dynamic ways to exchange ideas, shape policy, resolve problems, effect change, etc. However, when poorly designed and implemented, meetings accomplish little. They become virtual breeding grounds for confusion, tension, frustration, boredom and negativity. This course is for petroleum industry professionals who plan and conduct meetings.

Who Should Attend

Petroleum industry professionals who plan, conduct, and manage meetings



01 - MANAGEMENT SKILLS

Managing and Leading Others

Basic Level (16 Weeks Duration)

Description

This course increases the confidence and productivity of leaders, supervisors and managers who may be scientific or technical specialists, but have minimal training in the science and art of leading others. Skills in human relations, communication, motivation, and leadership are essential tools for the supervisor and manager. This course provides techniques enabling leaders to efficiently use one of the greatest resources a company has, its people. This highly interactive learning program will assist you in expanding your options for leading others. You will explore different concepts of management and leadership and how to apply your new skills in real world applications.

Who Should Attend

Anyone responsible for leading others in the daily performance of a work, including soon to be leaders, front-line leaders, new and experienced supervisors and managers, team leaders, coaches, and mentors.

Essential Skills for Resolving Workplace Conflict Among Coworkers

Intermediate Level (26 Weeks Duration)

Description

This course is uniquely designed for the petroleum industry and provides a basic understanding of conflict, how to respond positively to conflict, how to manage your personal conflict situations, how to use a basic mediation process and how to prevent conflict. The course relies heavily

on petroleum industry specific case studies and role play activities. It includes scenarios from major projects, well teams, multidisciplinary teams, petroleum operations and other petroleum industry organizations.

Who Should Attend

Any employee who may be exposed to internal or external conflict in their work environment and who can become more effective by managing this conflict.

Basic Conflict Management Skills for Managers and Leaders

Intermediate Level (26 Weeks Duration)

Description

This course is uniquely designed for the petroleum industry and teaches practical processes and skills for resolving interpersonal conflict in major projects, well teams, multidisciplinary teams, petroleum operations and other petroleum industry organizations. The course relies heavily on petroleum industry specific case studies and role play activities.

Who Should Attend

Supervisors, managers, team leaders, project managers, project engineers, project services managers, organizational specialists, facilitators, trainers, negotiators, procurement personnel and all individuals who are exposed to internal or external conflict in their work environment.



02 - PROJECT MANAGEMENT

Basic Oilfield Corrosion and Control via Chemical Solutions

Basic Level (16 Weeks Duration)

Description

This course will help attendees develop the awareness of importance and cost of corrosion and how it can be managed and mitigated. It teaches the skills of dealing with chemicals, techniques to evaluate their performances, chemical applications and design to control corrosion. It will also help attendees learn corrosivity monitoring and the efficiency of the treatment.

Who Should Attend

This course is intended for new graduates with chemistry or engineering backgrounds, mid-level engineers and technologist who have some basic prior knowledge of oilfield corrosion; all personnel involved in oil and gas production and processing; management wanting to increase awareness of corrosion impact on business operations and how negative outcomes can be mitigated.

Introduction to Project Management

Basic Level (16 Weeks Duration)

Description

As the relative importance of effective Project Management continues to grow in corporate recognition, as strategies are increasingly set with a project based delivery vehicle in mind, the need for in depth understanding of this complex subject grows. As those in the industry with the knowledge and expertise have an ever shorter period of their working lives left, to be replaced by a new and

younger generation, focus on the basics from which to build a robust and in depth knowledge and skill set is increasingly desirable. In order to ensure that competence is created within the next generation of project managers, this course serves as an in depth primer for those wishing to make this fascinating and dynamic area a career.

Who Should Attend

New employees/ graduates or anyone else wishing to obtain a firm understanding of the basics of Project Management. This course serves as a foundation upon which to build further specialist knowledge and create a transferable skill set applicable pan industry.

Petroleum Project Management: Principles and Practices

Basic Level (16 Weeks Duration)

Description

Running a successful petroleum operation requires a blend of technology, business savvy, and people skills. If you already have a firm grasp of exploration or production technology, learn to amplify its effectiveness with applied project management techniques. This course is aimed at helping technical personnel make the best business decisions that lead to lowest project cost while still meeting all production or exploration goals. This course covers the principles and application of project management to the upstream oil and gas business.

Who Should Attend

Exploration, production and management personnel interested in applying project management techniques to their operations.

Project Management for Brownfield Projects

Basic Level (16 Weeks Duration)

Description

This course is designed to teach the skills necessary to effectively plan and manage Brownfield projects or those in existing facilities. This includes due diligence of existing infrastructure, framing the project, concept selection techniques, managing stakeholders, and integration with Operations led projects. The course focuses on the unique challenges of Brownfield projects and how project leaders can effectively work in this Operations centric project environment. Exercises, the case study and discussions make the sessions challenging and insightful.

Who Should Attend

This course is designed for project managers, project engineers, operations staff, and all disciplines that work on integrated project teams for Brownfield or onshore and offshore projects that are installed in existing facilities. Case studies include modification to offshore structures as well as onshore projects.

Project Management for Engineering and Construction

Basic Level (16 Weeks Duration)

Description

This course will provide a comprehensive presentation and discussion of modern project management principles and practices as they relate to project concept selection, development planning, engineering design; procurement; and construction activities for facilities in oil or gas industry.



02 - PROJECT MANAGEMENT

Specific topics included in this course are schedule and cost management, risk management and proper use of scarce resources (people and materials) that will help the project manager make the best decisions possible. Upon completion of this course, the participant will know what the six project management phases entail and be able to employ key project management knowledge areas and project control tools to facilitate successful project outcomes. Participants will understand how project management process groups relate to one another, how execution plans are used to integrate the work effort, what tools are available for the project manager to use, what information will be generated, and what that information means.

Who Should Attend

Project managers, project engineers, facility engineers, operations engineers, and purchasing personnel including team leaders and managers who plan, manage, or participate on multi-discipline project teams.

Project Management in Upstream Field Development

Basic Level (16 Weeks Duration)

Description

This course addresses the special requirements associated with developing oil and gas plays where repetitive projects, such as well flow lines, tank batteries, booster compressors, short pipelines and meter stations, are a part of a larger field development program. It explains field development project management principles and practices as they relate to engineering design; procurement; and construction activities for upstream facilities in the oil and gas industry. Upon completion of this course, the participant will know what the engineering, procurement and

construction phases entail and be able to fit-for purpose project management techniques and project control tools to facilitate successful project outcomes. Participants will understand how the project management, drilling and completion, HSE, land, production and transportation disciplines relate to one another and what tools are available for the project manager to use to ensure interfaces among key stakeholders are managed.

Who Should Attend

It is intended for project managers, project engineers, facility engineers, operations engineers, project controls and purchasing personnel who plan, manage, or participate on multi-discipline field development project teams. Special emphasis will be placed on large projects associated with unconventional field development projects, such as shale oil and coal bed methane, as well as projects associated with conventional plays.

Risk Management for Upstream Capital Projects

Intermediate Level (26 Weeks Duration)

Description

This intermediate level course for project managers, project engineers, and integrated project team discipline members addresses the key areas associated with capital project risk management. The course focuses on managing risk throughout the entire project life cycle. This course is very much hands-on with class exercise case studies that focus on participant development of risk management deliverables. The class also addresses the methods that project team leaders can utilize to ensure that project team members and management buy in and are part of the risk management process.

Who Should Attend

Project managers, project engineers, and all disciplines that work on integrated project teams for upstream on-shore and offshore developments.

The Science and Technology of Water Treating

Basic Level (16 Weeks Duration)

Description

This course provides a fundamental understanding of the science and practical applications of water treating. It presents the fundamental mechanisms behind various water treating equipment and processes. Throughout the course, field experiences, practical issues, and field performance of equipment is analyzed and explained in terms of surface science, chemistry and engineering principles. The scientific aspects of water treating are presented in a practical down-to-earth manner that can be understood with little prior study, and can be immediately implemented in the field. The full project life cycle is covered from concept selection to front end engineering, detailed design, operation, and troubleshooting.

Who Should Attend

The course is intended for process, facilities, and chemical engineers involved in either designing or troubleshooting water-treating systems.



02 - PROJECT MANAGEMENT

Understanding Inorganic Scaling: Mechanisms, Control, and Management

Basic Level (16 Weeks Duration)

Description

This course is an introduction to inorganic scaling. It includes an overview of the different types of inorganic oil-field scales encountered during production, and the various methods used to control them.

Who Should Attend

Scaling is one of the most persistent flow assurance issues in the oilfield. Anyone involved on the production side of the business should have a basic understanding of problems of inorganic scale.

Flow Assurance: Managing Flow Dynamics and Production Chemistry

Intermediate Level (26 Weeks Duration)

Description

This course presents a holistic approach to flow assurance. The course will introduce technologies, workflows and their deployment for the identification, characterization, and management of flow impediments, such as slugging and precipitation of organic and inorganic solids. The course will present best practices and fit-for-purpose design solutions for minimizing the risk of flow stoppage while transporting hydrocarbons from "Pore to Sales Meter". The principles will be demonstrated using field examples from around the world.

Who Should Attend

This course is intended for engineers and chemists in the upstream and downstream segments of the petroleum industry.

Multiphase Pumping: Fundamentals to Field Applications

Intermediate Level (26 Weeks Duration)

Description

This course is an overview of state-of-the-art multiphase pumping technology. It covers the various aspects of multiphase pumping, from concept to field applications, with emphasis on the practical side.

Who Should Attend

Petroleum, reservoir, production, facilities engineers, as well as operations and maintenance staff will benefit from this course. It is also for project engineers and managers who are considering the use of multiphase pumps in their projects.

Project Cost Scheduling

Intermediate Level (26 Weeks Duration)

Description

The financial dynamic to successful project delivery lies at the very heart of effective project management. A project is a complex series of interactions between time; people and resources - their allocation and utilization. Project Cost Scheduling highlights and informs the participant of how to manage the project cost function - its dynamics and components - leading to an enhanced understanding and

application of techniques that will contribute directly to more efficient project management processes. The course contains a significant element of practical exercise that builds daily, allowing participants to grasp the inter-relationships between cost; project lifecycle and operational activities, thereby imparting clarity to the whole process of successful project delivery.

Who Should Attend

Exploration, production, and management personnel who wish to apply project management techniques to their activities and operations

Project Decision-Making

Intermediate Level (26 Weeks Duration)

Description

Project success depends on the effectiveness of all project decisions, not just the few made formally via structured methods. This course applies a variety of insights from diverse fields including psychology, cognitive science, naturalistic decisionmaking, action science, sense making, mathematics, and communication theory to improve engineering decision-making. Learnings and insights from the course are used to develop a strategy for improving decision-making and to develop answers to four questions of key importance in project design:

- Why do so many changes occur late in projects?
- Why do we have so many problems at interfaces?
- Why do we repeat mistakes from project to project?
- Why do projects usually finish late?



02 - PROJECT MANAGEMENT

Who Should Attend

Engineers, operations staff and other technical professionals involved in project design, execution or operation.

Risk Management for Upstream Capital Projects

Intermediate Level (26 Weeks Duration)

Description

This course addresses the key areas associated with capital project risk management. The course focuses on managing risk throughout the entire project life cycle. This course is very much hands-on with class exercise case studies that focus on participant development of risk management deliverables.

Who Should Attend

Project managers, project engineers, and all disciplines that work on integrated project teams for upstream onshore and offshore developments.

Advanced Project Management

Advanced Level (39 Weeks Duration)

Description

This specific course is for professionals seeking an in-depth understanding of key principles and techniques of project management. This course provides advanced knowledge in contract strategy, project governance, engineering and technology management, stakeholder management, joint venture and non-operated projects, interface management, risk management, reviews and approvals and management information systems.

Who Should Attend

Project Managers, Asset Managers, Project Control Managers and Project Engineers Experienced project managers, project engineers, asset manager, project controls managers and construction managers that are involved in engineering, procurement and construction of surface facilities and pipelines for large onshore and offshore projects.

Offshore Pipeline Projects

Advanced Level (39 Weeks Duration)

Description

This course is a practical, hands-on work session in offshore pipeline project management, addressing the six key phases of project execution:

- Development,
- Engineering,
- Procurement,
- Construction,
- Pre-commissioning, and
- Start-up/operations.

The course maintains a balance between lecture and work session using in-class exercises to demonstrate the relationships between sound practice and application.

Who Should Attend

This course is for pipeline personnel who are or will be responsible for the execution of offshore pipeline projects. Participants should include personnel from operator's pipeline project teams, design engineering staff, material supplier, and construction contractor personnel. The course is designed to benefit all levels of experience.



03 - PETROLEUM INDUSTRY

Basic Drilling, Completion and Workover Operations

Basic Level (16 Weeks Duration)

Description

This course gives a technical overview of the science and art of drilling operations, completion practices and post-completion wellbore enhancement or remedial workover techniques (well intervention).

- *Reservoir Engineers* will learn what can be done within open-hole and cased wells as they execute reservoir management.
- *Drilling and completion personnel* will learn how the producing reservoir can be damaged or stimulated by what they do.
- *Participants* will learn to visualize what is happening "downhole", discover what can be accomplished and gain an appreciation for wellbore risks and the possibility of damage to the formation; and how drilling and completion practices can alter reservoir interpretation and performance.

Who Should Attend

Technical, field, service, support and supervisory personnel desiring to gain an introductory overview of these topics and how they interrelate. Excellent for cross-training of other technical disciplines such as reservoir and surface facility engineers plus geoscientists, and anyone who interacts with drilling, completion or workover design engineers such as technical supervisors and technical service personnel.

Basic Petroleum Economics

Basic Level (16 Weeks Duration)

Description

Could you answer the following three questions for your next project? What will it cost? What is it worth? Will it earn sufficient profit? Before undertaking any project, these questions should be answered. This course will provide the fundamentals necessary to enable you to do so. Budgeting and financing, and contractual arrangements, which also significantly impact the economic viability of a project, are covered. Participants will practice cash flow techniques for economic evaluations and investigate frequently encountered situations.

Who Should Attend

Engineers, explorationists, field accounting supervisors, managers and other personnel who need to develop their skills and understanding of the basic economic analysis, profitability of petroleum exploration and production.

Basic Petroleum Engineering Practices

Basic Level (16 Weeks Duration)

Description

This course is a basic introduction to most aspects of the Petroleum Engineering discipline which includes Reservoir, Production and Drilling Engineering as well as related topics. This course lays the groundwork for further specialized training in advanced courses for oil company and service company personnel. The course focuses on the field and application approach; and includes classroom ex-

ercises, fundamental engineering problems and basic field exercises. Basic Petroleum Engineering Practices will set the foundation for technical professionals with regards to technology and its engineering applications.

Who Should Attend

Engineers, engineering trainees, technical managers and assistants, technicians, geologists, geophysicists, chemists, physicists, service company personnel, sales representatives, and data processing personnel

Basic Petroleum Technology

Basic Level (16 Weeks Duration)

Description

This course presents a non-technical, practical understanding of petroleum industry technology in an interesting, effective, and efficient manner. After being taught key concepts participants are given case-studies in which they adopt roles of Reservoir Engineer and Drilling/Completion Engineer to get a basic understanding of real-life situations and perform basic analysis.

Who Should Attend

Non-Technical, Administrative, management, field support, accounting, purchasing, economics, legal, finance, human resources, drafting, land and data processing personnel, as well as investors and royalty owners.



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Cost Management

Basic Level (16 Weeks Duration)

Description

Few problems threaten the petroleum businesses more than uncontrolled costs. The course will cover costs management from the basics to the most recent events and trends, using relevant exercises, timely case studies and role-playing techniques. This course is an introduction to Practical Cost Management techniques designed to help the participant better understand the underlying dynamics of cost, which will lead to better decision making concerning products and services, work flows, capital investments, as well as the day-to-day monitoring of the business.

Who Should Attend

Operating managers, field personnel, project managers, technology managers, budget managers, or practically anyone in the company wanting to manage costs in a more efficient and effective manner.

Deepwater Drilling and Production Technology

Basic Level (16 Weeks Duration)

Description

This course describes the deepwater technology that has been developed and implemented in the last few years. Each of the DW system components is discussed in terms of its engineering challenges. Introducing each technology area is a brief description of the conventional water depth technology from which the new, DW concepts have

evolved. The basis for selection of particular field configurations are discussed.

Who Should Attend

Individuals with at least some awareness of basic offshore engineering and operations. Technical staff, project engineers, engineering discipline leads, engineering specialists and operating staff find this course accelerates their capability to contribute to deepwater development planning, design and construction projects and field operations.

Economics of Worldwide Petroleum Production

Basic Level (16 Weeks Duration)

Description

Techniques for predicting profit, production, operating costs, and cash flow are taught in this course to help participants in evaluating decision alternatives for optimum results. Understanding cost of capital, financial structure, risk and uncertainty, present worth, rate of return, and other economic yardsticks enhances the quality and the value of economic analysis.

Who Should Attend

Managers, supervisors and operating personnel concerned with costs, profitability, budgets, the company "bottom line" and other aspects of economic analysis of petroleum production on a project, corporate, and worldwide basis, who have had some previous experience in this area.

Evaluating and Developing Heavy Oil Resources

Basic Level (16 Weeks Duration)

Description

The course is largely designed for geoscientist or engineers with a need to advance their understanding of heavy oil resources. It provides an overview and details of specific occurrences of the geology, evaluation, development and commerciality of heavy oil resources. Beginning level concepts are covered and widely focused enough to appeal to a broad audience seeking an introduction to the business of heavy oil including non-technical administrative and business groups. However, more technically advanced topics are also covered where the student is generally expected to have a technical foundation for understanding.

Who Should Attend

Geoscientist or engineers with a need to better understand the challenges of evaluating and developing heavy oil resources.

Evaluating and Developing Shale Resources

Basic Level (16 Weeks Duration)

Description

This course will cover current practices for evaluating, drilling and completing these challenging reservoirs. Discussion will include a focus on the limitations of many of the current tools and technologies. Information and opportunities for international shale plays will be described. Participants will leave the course with a foundational understanding of value-adding shale gas resource practices and



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an insight into determining the critical reservoir parameters used to predict a potential commercial resource play.

Who Should Attend

Reservoir, production and completion engineers, petrophysicists, geologists, geophysicists and other professionals who desire a thorough overview of both current and emerging concepts, technologies and processes related to shale gas and shale oil resource development.

Exploration and Production Process Basics: Understanding Petroleum Industry Value Cycle

Basic Level (16 Weeks Duration)

Description

This course describes the petroleum value chain from prospect identification, to project commissioning and to final abandonment.

Participants will leave this course with a firm understanding of the petroleum industry including, the knowledge and tools necessary for understand the relationships and dependencies across the E&P industry.

This course offers a fresh look at a range of critical, inter-related topics and will be taught with the modern learner in mind. Uncertainties, risk management, business practices and project management lessons are learned through these team based events.

Who Should Attend

This training course is designed for Newly-hired engineers and geoscientists



Field Study - Heavy Oil Resources

Basic Level (16 Weeks Duration)

Description

The course is geologically and technically focused but instructed in a manner so that all disciplines and experience levels will understand. Mining and on site production of bitumen from the Athabasca oil sand region is currently a major contributor to the world's oil production. These technologies are reasonably recent commercial applications and the future levels of production faces uncertainty because of highly debated environmental challenges. The field course takes the student to the rock; explaining complex relationships and issues emanating from the depositional and structural framework.

Who Should Attend

Anyone who wants a hands-on understanding of the Athabasca Oil Sands.

Fundamentals of Reservoir Description and Modeling with Geo-statistics

Basic Level (16 Weeks Duration)

Description

This course introduces engineers, geologists, and geoscientists to the fundamental theory and practice of reservoir description and modeling for reservoir management. Participants will learn the fundamental concepts of reservoir description and modeling using geostatistical techniques. This course emphasizes the principles and practice of integrated studies and uncertainty analysis.

Who Should Attend

This course is for petroleum engineers, geologists and geoscientists who want to apply reservoir description and modeling techniques for reservoir management. It is also for managers and supervisors who wish to update their skills to the current level of the technology.

Introduction to Petroleum Business

Basic Level (16 Weeks Duration)

Description

This course will introduce participants to key concepts of the petroleum business including its structure, how oil companies are organized and financed and what it takes to be financially successful. Success will be explored through an understanding of the meaning of long-term shareholder value, its measurement at the macro and micro level and the role competitive advantage plays in achieving superior financial goals. Participants will be introduced to both accounting and economic evaluation as a means to



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understanding the financial side of the petroleum business. Additionally, participants will be introduced to risk and its impact on economic evaluation.

Who Should Attend

Engineers, geologists, geophysicists, landmen, HR and other non-finance and accounting professionals who need an introduction to the business aspects of the petroleum industry including the interplay of finance and economic evaluation in the creation of long-term shareholder value.

Oil and Gas Business Discovery

Basic Level (16 Weeks Duration)

Description

This simulation experience enables participants to assume the role of senior management who are managing operations spanning the full value chain from license acquisition to exploration, appraisal and production, and oil & gas marketing. The program takes participants on a simulated, multi-year journey where small teams collaborate, build fundamental capabilities and practice real-world decision making.

Who Should Attend

Staff from all disciplines who want to know more about the full value chain and to gain a deeper understanding of the part their role plays in a wider context.

Overview of the Heavy Oil Resources

Basic Level (16 Weeks Duration)

Description

Heavy oil is a large component of the world's oil resource. Commercial mining and current in-situ thermal production methodologies are important contributors to the world's oil production. These technologies are reasonably recent commercial applications, and the future levels of production face uncertainty because of highly debated environmental challenges. This course takes an unbiased practical approach to the applications citing benefits and limitations. Overview of Heavy Oil Resources provides an overview of the aspects of the geology, development and commerciality of heavy oil resources.

Who Should Attend

Anyone of any discipline who needs a better understanding of heavy oil resources

Overview of the Petroleum Industry

Basic Level (16 Weeks Duration)

Description

This course presents an overview of the Petroleum Industry from the point-of-view of the Asset Management Cycle. By explaining the real-life steps involved in the creation and exploitation of oil and gas fields, participants will be given introduction to the exciting processes which drive industry and create new value. Emphasis is on Onshore as well as Offshore projects, including both large and small fields. Each step of the cycle is introduced with a summary

of relevant technologies, economics, manpower requirements, importance of training and competency assessment, as well as relevant case histories. Both conventional and unconventional oil and gas prospects are included.

Who Should Attend

Both technical and business oriented professionals who are either new to the upstream oil and gas industry or experienced in one part, but could benefit from a wider point of view, all levels of support staff working in the industry, as well as investing or financial personnel with a need to better understand the industry.

Petroleum Budgeting and Performance Workshop

Basic Level (16 Weeks Duration)

Description

Global oil and gas companies are becoming more and more complex in their operations and the projects are growing larger and more expensive. As prices and costs fluctuate widely in a matter of months, it is more important than ever to be able to create budgets and make plans that are accurate and flexible. This course is an introduction to Budgeting and Planning techniques designed to help the participant better understand the underlying dynamics of operational inputs and how they determine performance, which should eventually lead to better decision making concerning work flows, products and services and capital investments.

Who Should Attend

Operating managers, field personnel, project managers, technology managers, cost control personnel, budget analysts, financial analysts, department managers, or anyone



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in the company dealing with budgets, planning and performance analysis.

Petroleum Finance & Accounting Principles

Basic Level (16 Weeks Duration)

Description

Making the most efficient use of your resources is critical to the success of any company. Finance and accounting comprise the universal business language and help you manage those resources effectively. Planning and decision making that occur in an informal financial context permit better application of resources and promote competitive advantage.

The aim of this course is to improve participant's job performance by enhancing their understanding of current international practices in finance and accounting within the E&P industry.

Who Should Attend

Personnel new to the oil and gas accounting industry, others desiring to understand or refresh their knowledge of basic petroleum accounting concepts, other financial personnel needing to understand unique issues as they relate to the petroleum industry and technical people looking for the basic concepts of accounting and finance.

Petroleum Risk and Decision Analysis

Basic Level (16 Weeks Duration)

Description

Good technical and business decisions are based on competent analysis of project costs, benefits and risks. Participants learn the decision analysis process and foundation concepts so they can actively participate in multi-discipline evaluation teams.

- The focus is on designing and solving decision models.
- Probability distributions express professional judgments about risks and uncertainties and are carried through the calculations.
- Decision tree and influence diagrams provide clear communications and basis for valuing each alternative.
- The complementary Monte Carlo simulation technique is experienced in detail in a hand-calculation exercise.
- Project modeling fundamentals and basic probability concepts provide the foundation for the calculations. The mathematics is straightforward and mostly involves only common algebra.

The emphasis in this course is on practical techniques for immediate application.

Who Should Attend

Geologists, engineers, planners, economists, geo-physicists, team leaders and managers.

Production Forecast and Reserves: Estimates in Unconventional Resources

Basic Level (16 Weeks Duration)

Description

This course teaches the skills and understanding needed to forecast production and estimate reserves in unconventional (ultra-low permeability) oil and gas reservoirs. The course emphasizes "simple" production decline models appropriate for routine forecasting for hundreds of wells in short periods of time. Both tight oil and gas reservoirs, such as shales resources, are discussed.

Who Should Attend

The course is for engineers and geoscientists who are interested in learning how to evaluate unconventional reservoirs.

Ensuring Reliable SCAL Data for Reservoir Modeling

Intermediate Level (26 Weeks Duration)

Description

Special Core Analysis, SCAL data has a direct impact on the way fluids are allocated and distributed in the reservoir simulation models, which would directly impact reservoirs' STOIP (Stock Tank Oil-Initially-In-Place) estimation and their distribution. Moreover, it directly affects the performance of secondary and EOR flooding processes, and in turn impacts the accuracy of the oil and gas reserve estimates, and the management of these reserves.

Therefore, SCAL data could be considered as one of the most critical reservoir input data for reservoir simulation



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models. This course will shed light on the theoretical and experimental background of SCAL data:

- It will explain the concept of reservoir wettability and different factors that could induce changes in reservoir wettability.
- It will cover the concept of capillary pressure and its associated hysteresis for different wettability conditions, followed by the concepts of two phase water/oil and gas/oil relative permeability curves and how to generate three relative permeability data for water wet, mixed and oil wet reservoirs.
- It will clarify the saturation end point of both capillary pressure and relative curves as a function of reservoir heterogeneity and wettability.

Finally, the course will support the idea of reservoir wettability profile, when will it happen and how to deal with it.

Who Should Attend

This course is designed for Research and Development Engineers, Technical Managers, Reservoir Engineers, Reservoir Geologists, Petrophysicist, and Geophysicists.

Field Development Economics

Intermediate Level (26 Weeks Duration)

Description

In this course, participants will learn to construct an economic evaluation of a field development opportunity using common industry indicators. Supported by many practical examples, the course covers both greenfield and brownfield situations.

Who Should Attend

This course is for engineers, geoscientists and managers who want to use economic methods for making field development decisions.

Fundamentals of International Oil and Gas Law

Intermediate Level (26 Weeks Duration)

Description

This course is designed to give participants a basic understanding of the legal fundamentals that make their international transactions work, ranging from the principles that apply to interpreting and enforcing their agreements, to the procedures for resolving their disputes, to addressing interpretational issues posed by common contract provisions, and to avoiding liability under environmental and bribery laws. The course will allow participants to identify confidently potential legal problems, to address them before they become serious, and to facilitate the smooth interaction between oil and gas professionals, host government representatives, and their lawyers.

Who Should Attend

Petroleum managers who deal with international oil and gas legal matters in the course of their business; and legal professionals with little training in oil and gas law, but expect soon to deal with international oil and gas law matters.



International Petroleum Contracts

Intermediate Level (26 Weeks Duration)

Description

You will learn the philosophy, evolution, and fundamentals of international petroleum contracts and have an opportunity to see how each of these actually works. You will take part in life-like negotiating sessions mastering many negotiating techniques, where a mistake is a learning experience not a disaster. A viable contract cannot be negotiated without an effective understanding of the underlying economics. Negotiating strategies will determine contractual terms ultimately defining the economic benefits to be realized. Concessions and production sharing agreements are two of the contract types to be evaluated during this course.

Who Should Attend

Exploration & production managers; national oil company managers; government representatives and others in the oil industry who expect to be involved in negotiating, administering, reviewing, managing, directing, and overseeing international exploration and production contracts.



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Modern Production Data Analysis for Unconventional Reservoirs

Intermediate Level (26 Weeks Duration)

Description

This course provides attendees with a comprehensive methodology for well performance analysis with specific focus on unconventional oil and gas. The approach combines the use of several powerful techniques and will illustrate the practical aspects of production data analysis.

Who Should Attend

This course is for engineers and technologists involved in exploitation, evaluating reserves, optimizing production or analyzing well tests.

Petroleum Reserves

Intermediate Level (26 Weeks Duration)

Description

In this course, participants learn to estimate petroleum reserves using SEC and SPE/WPC definitions, guidelines and latest interpretations. Instructors will present the main reservoir engineering and geoscience methods used to estimate reserves, and demonstrate how definitions affect such estimates. Case studies are used to illustrate different methods for estimating reserves, along with typical errors and how to avoid them. Participants will also learn supplemental techniques such as reservoir simulation and probabilistic methods for estimating reserves.

Who Should Attend

This course is designed for industry professionals involved in estimating or filing petroleum reserves under SEC or

SPE/WPC guidelines, or any oil or gas professionals interested in gaining a better understanding of the process of estimating reserves.

Practical Techniques for Screening Deepwater: Offshore Oil & Gas Exploration Prospects

Intermediate Level (26 Weeks Duration)

Description

This course will discuss the practical state-of-the-art techniques of Volume to Value(VV) to help attendees assess exploratory deepwater offshore oil and gas prospects and quantify economic values of the prospects.

Participants will learn how to develop a preliminary field development plan for a given discovery prospect and estimate oil and gas recovery, wells required, and costs. They will also learn how to conduct economic evaluation for lease sales or farm-in opportunities.

Who Should Attend

This course is for petroleum, reservoir and production engineers, and geoscientists, economists, managers, and investors as well as government officials interested in screening deepwater offshore oil and gas exploration prospects for lease sales and/or farm-in opportunities should attend this course.

Project Risk, Uncertainty, and Decision Analysis

Intermediate Level (26 Weeks Duration)

Description

In this course, you'll learn to apply risk and uncertainty

management principles to decision quality analysis in the development of oil and gas reserves. This course starts with setting the background with statistics and probabilities, estimating under uncertainty and probabilistic reserves estimation principles. Then it introduces ways to determine the chance of geological and commercial success, and the use of decision trees to assess the value of new information.

Who Should Attend

This course is for anyone who is involved with making quality decisions about the development of subsurface hydrocarbon accumulations.

Strategic Thinking: A Tool-Based Approach

Intermediate Level (26 Weeks Duration)

Description

This course is a hands-on, case-based course focused on managers responsible for building and sustaining a successful strategic plan. Participants are exposed to a variety of perspectives on, approaches to, and tools for the conduct of strategic management. These tools address strategy from a macro and micro perspective.

There is a major emphasis on historical, current, and potential "game changers", especially on how they are now transforming the industry's future. Applied techniques during this course provide opportunities for individualized and team-based learning.

Who Should Attend

Geologists, geophysicist, engineers, managers, and executives responsible for defining, assessing and developing



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business alternatives & strategy in the petroleum industry.

Unconventional Reservoir Production (Rate Transient) Analysis

Intermediate Level (26 Weeks Duration)

Description

This course provides an overview of the state-of-the-art in unconventional gas (shale gas, tight gas, and coalbed methane) and light oil (shale oil, tight oil, and “halo” oil) well production analysis. An overview of analytical methods for RTA is then provided, including a discussion of how these techniques can be modified to account for unconventional reservoir properties such as multi-phase flow, non-static permeability, non-Darcy flow, and desorption. Empirical methods for production analysis are also briefly reviewed in this course. Tight gas, shale gas, tight oil, shale oil, and coalbed methane field examples are provided to illustrate application of the techniques.

Who Should Attend

Engineers, geologists and managers in industry involved in developing / evaluating unconventional gas reserves.

Advance Decision Analysis with Portfolio and Project Modeling

Advanced Level (39 Weeks Duration)

Description

Quality forecasts and evaluations depend upon well-designed project and portfolio models that are based upon clear decision policy, sound professional judgments, and a good decision process. In this course participants learn to build good models. Our emphasis is on the evaluation

concepts and techniques, rather than particular software.

Who Should Attend

Evaluation engineers, analysts, managers, planners, and economists. This course is intended for professionals involved with developing project evaluation, portfolio, and other forecasting and assessment models.

Note: *Prior background in decision analysis is expected.*

History Matching and Conditioning Reservoir Models to Dynamic Data

Advanced Level (39 Weeks Duration)

Description

This course explores ways to incorporate production data into high-resolution reservoir models using both conventional and fast-flow simulation techniques, and it examines the merits of various history matching workflows practiced in the industry. Both assisted history matching and automatic history matching techniques will also be covered.

Who Should Attend

This course is intended for engineers, geologists, and geophysicists interested in reservoir characterization, reservoir management/optimization & history matching of geologic models.

Oilfield Data Mining

Advanced Level (39 Weeks Duration)

Description

This course examines the successful application of Artificial

Intelligence and Data Mining (AI&DM) in the E&P industry in the past several years. It will start with the fundamentals of AI&DM, covering artificial neural networks, evolutionary computing, and fuzzy logic.

The course is devoted to field application of this technology with focus on production optimization and recovery enhancement.

Who Should Attend

This course is designed for reservoir, completion and production engineers of operating companies as well as service company personnel involved with:

- Planning,
- Completion, and
- Operating wells.



04 - OPERATIONS MANAGEMENT

Applied Maintenance Management

Basic Level (16 Weeks Duration)

Description

This course provides essential knowledge required for achieving excellence in maintenance management. Work control, planning, and scheduling will be covered. Participants will receive a sound, integrated, basic knowledge of the maintenance function and how to progress towards world-class performance. Individual action plans will carry course learning into the work environment.

Who Should Attend

Maintenance supervisors, team leaders, or managers needing to improve their maintenance programs. This course is a broad survey of essential aspects of maintaining a safe, efficient and reliable facility asset.

Contracts and Tenders Fundamentals

Basic Level (16 Weeks Duration)

Description

Contracts and Tenders Fundamentals will provide attendees with a more strategic approach to contracting, along with numerous tools to use throughout the contracting process. When you leave this course, you will improve job performance through: 1) better alignment of contract process steps with supply needs; 2) better contracts; 3) fewer disputes and claims; and 4) better contract outcomes. Contracting involves many roles that must work together to achieve desired outcomes. Everyone involved in some element of contracting must understand the entire process,

keys to success and what is required of their role. Materials and exercises are built around oil and gas industry issues to be more relevant to the needs of attendees.

Who Should Attend

- Individuals involved in any aspect of sourcing, tendering, selecting, forming and executing contracts with suppliers of goods and services to the oil and gas industry.
- It includes supply chain roles such as contracting and procurement specialists, sourcing specialists, category managers, and logistics managers.
- It is also intended for technical roles assigned to project work such as facilities engineers, drilling engineers, project engineers and coordinators, commissioning engineers, contracts engineers, planning engineers, asset managers, and legal trainees.

Effective Materials Management

Basic Level (16 Weeks Duration)

Description

This course covers practical considerations essential to achieve major improvements in planning, buying, storing and disposing of the vast array of materials and spare parts needed in oil and gas industry. Evolving best practices in the industry are explored for inventory management, warehousing and investment recovery.

Who Should Attend

- Professional and management personnel who have responsibility for, materials, spare parts and supplies needed to support any refinery, gas plant, onshore/offshore production or other industry operations.

- Buyers, procurement specialists, stock analysts, and logistics, warehouse, distribution or operations supervisors will benefit from this course by learning the techniques and principles for providing better service to their operations, reducing stock outs and surplus materials and maximizing the return on investment for inventory.

Fractional Distillation

Basic Level (16 Weeks Duration)

Description

This course shows how crude oil is converted by fractional distillation to premium quality gasoline, diesel, kerosene, jet fuel, lubes, and subsequent chemical / refinery unit feedstocks. The course is excellent for experienced operators who want to understand the 'why' as well as the 'how' of separation, fractional distillation, and splitting processes. The course introduces operators to basic troubleshooting techniques for the process, equipment, and critical controls.

Who Should Attend

Refinery, process unit operations and maintenance technicians, supervisors and managers, as well as other non-engineering personnel requiring a fundamental focus on refinery processing facilities.



04 - OPERATIONS MANAGEMENT

Fundamentals of Process Safety

Basic Level (16 Weeks Duration)

Description

The course is designed to cover the fundamentals of Process Safety for all staff levels in a high hazard installation. It will benefit anyone who requires to understand the essentials of process safety including managers, supervisors, technical, engineering, HSE, maintenance and operational staff who are associated with the design, construction, operation, maintenance and governance of high hazard installations in the upstream and downstream oil, gas and petrochemical industry.

To explore the multiple roles involved in Process Safety and allow participants from different backgrounds to relate to this subject there is a rolling case study throughout the course.

This course will identify how different disciplines and roles can have an impact on safety performance.

Who Should Attend

All staff associated with the operation, maintenance and governance of high hazard installations in the upstream and downstream oil, gas and petrochemical industry.

The content is relevant to all roles, including senior management, project and engineering support teams, HSE support, supervisors and operator and maintenance technicians.

Gas Dehydration and Amine Sweetening for Operations & Maintenance

Basic Level (16 Weeks Duration)

Description

This course will provide the basic knowledge required for understanding operating issues in natural gas amine sweetening and dehydration units. This course is customizable to client needs.

Who Should Attend

Plant and facility operations and maintenance technicians, supervisors and managers.

Gas Production/Processing for Operations & Maintenance

Basic Level (16 Weeks Duration)

Description

This course will provide a more detailed examination of the processes found in gas production facilities, including the important theoretical aspects that must be mastered before operators can truly understand their processes and become proficient at avoiding problems and troubleshooting the technical problems that do arise. This course prepares operations personnel to communicate better and work more closely with professional engineering staff.

Who Should Attend

Plant and facility operations and maintenance technicians, supervisors and managers.

LNG Facilities for Operations & Maintenance

Basic Level (16 Weeks Duration)

Description

The course includes in-depth information on basic LNG mixed refrigerant processing. Instructors will explain contaminant removal processes employed in LNG processes. Relevant details of the APCI process in LNG liquefaction are described. Class exercises/problems focus on application of theory to operational trends so operators can understand their processes and become proficient at identifying issues and troubleshooting problems before production suffers.

Who Should Attend

LNG plant and utility operations and maintenance technicians, supervisors and managers.

Maintenance Planning and Work Control

Basic Level (16 Weeks Duration)

Description

This course is designed to build competency in Work Control as a primary skill set in the Competency Map for Facilities Maintenance Management. It will focus on the six phases of work management: work identification, planning, prioritization, scheduling, execution and history capture. These essential skills are the key components of integrity management, safety, resource control, and reliable operation.



04 - OPERATIONS MANAGEMENT

Who Should Attend

Maintenance managers, superintendents, supervisors, team leaders and planners engaged in work management, planning, and scheduling.

NGL Fractionation and Cryogenic NGL Recovery for Operations & Maintenance

Basic Level (16 Weeks Duration)

Description

This course will provide the basic knowledge required for understanding operating issues in cryogenic NGL (Natural Gas Liquids) extraction and stabilization/fractionation. Course content is non-mathematical.

Who Should Attend

Plant and facility operations and maintenance technicians, supervisors and managers.

Oil & Gas Processing Facilities for Operations & Maintenance

Basic Level (16 Weeks Duration)

Description

This course will provide the basic knowledge required for understanding processes and operating issues common to oil and gas processing facilities.

Who Should Attend

Production and processing operations and maintenance technicians, supervisors and managers, as well as other non-engineering personnel requiring a broad introduction to production and processing facilities, including the separation, conditioning and disposition of produced oil,

gas and water; including the common operational difficulties that may arise, as well as the operational tactics used to resolve them.

Cost/Price Analysis and Total Cost Concepts in Supply Management

Intermediate Level (26 Weeks Duration)

Description

Managing and reducing cost continues to be one of the primary focal points of business and governments today. Maintaining a competitive position and even survival will depend on the organization's ability to use all of the continuous improvement strategies which have been developed to reduce cost across the entire supply chain for the life of the product or service.

Fundamental to developing and implementing these strategies is knowledge of Cost/Price Analysis, Value Analysis and Total Cost of Ownership concepts.

This course provides the concepts of Cost/Price/Value Analysis and Total Cost of Ownership that are essential skill sets in developing and implementing the strategies required to achieve the high levels of cost reductions possible from the supply chain.

Who Should Attend

Managers and professionals in purchasing, procurement, and contracts and those involved in activities that expose them to suppliers and buying activities for production, maintenance, equipment and services requirements.

Inside Procurement in Oil & Gas

Intermediate Level (26 Weeks Duration)

Description

This course will expand the industry understanding of supply chain professionals and increase their value-added in a global, fast changing environment. Participants will learn what each industry segment requires from procurement and be given insights to maximize value delivery and increase their contribution to any business unit of the organization. Attendees will leave better prepared to create and support procurement strategies that meet stakeholder needs whether for projects or operations support.

Who Should Attend

Supply chain professionals with 2-7 years experience either inside or outside the oil and gas industry. The course is for anyone who needs a better understanding of procurement value creation in the oil & gas industry

Strategic Procurement & Supply Management in the O&G Industry

Intermediate Level (26 Weeks Duration)

Description

This program explores key concepts forming the basis of strategic supply management and moves today's supply management organization from its typical tactical focus to the strategic focus needed to successfully implement the processes and methods needed to gain performance.

Who Should Attend

Managers and Professionals in Supply Management, Pro-



04 - OPERATIONS MANAGEMENT



curement, Purchasing, Contracts, Materials, Inventory Control, Projects, Maintenance, Operations, Finance and all other Managers and Professionals interested in lowering total cost and increasing productivity and profit contributions from better supply management operations in obtaining equipment, goods, and services in the Oil and Gas Industry.

Supplier Relationship Management

Intermediate Level (26 Weeks Duration)

Description

Continuous improvement in all aspects of the supply chain is necessary to remain competitive in today's global economy. Supplier Relationship Management (SRM) and collaboration provide an organizational focus on communicating with suppliers on the many steps of the Supply Management process. This focus reduces the lead-time and total cost of acquisition, transportation, administration, and possession of goods and services for the benefit of both the buyer and seller and as a result provides a competitive advantage and improved profits.

Who Should Attend

Managers and professionals involved in purchasing, projects, contracts, supply management, operations, maintenance, engineering, quality, and other activities that expose them to dealings with suppliers for goods, equipment, and services in the Oil and Gas Industry and who want to improve the supplier relationship for the benefit of both.



05 - PROCESS FACILITIES

Applied Water Technology in Oil and Gas Production

Basic Level (16 Weeks Duration)

Description

This course provides an overview of the main water handling systems typically encountered in upstream (E&P) production operations, both onshore and offshore. The chemistry of the main water related problems of mineral scales, corrosion, bacteria, and oily water will be reviewed both from the theoretical and practical aspects. Produced water treatment equipment and typical water quality specifications will be reviewed as well as water injection and disposal systems. Emphasis will be placed on understanding and resolving operational problems in process equipment.

Who Should Attend

Managers, engineers, chemists, and operators needing to understand water related problems in oil and gas production and their solutions.

Corrosion Management in Production/Processing Operations

Basic Level (16 Weeks Duration)

Description

This course will cover the main causes of corrosion in upstream oil and gas operations, as well as monitoring and mitigation methods. The various corrosion mechanisms give rise to a number of different forms of corrosion damage which will all be considered. Participants will estimate the corrosivity of a given environment through analysis of the chemical and physical characteristics of the system.

You will review approaches to selecting materials and coatings for corrosion resistance for different conditions and their applications.

The course content is based on a field facilities engineering point of view as opposed to a more narrowly specialized corrosion engineering or chemistry viewpoint. This course provides an appropriate balance of necessary theory and practical applications to solve/mitigate corrosion related problems.

Who Should Attend

Managers, engineers, chemists, and operators needing to understand corrosion and its control management in oil and gas production and processing.

Introduction to Oil and Gas Production Facilities

Basic Level (16 Weeks Duration)

Description

This course provides a high level discussion of surface processing facilities used in oil and gas production with emphasis on the selection and specification of these facilities as part of a field development plan.

The importance of knowledge about reservoir type, produced fluid composition and properties, drive mechanism, facility location, product specifications and contractual obligations is highlighted.

Who Should Attend

This course is intended for those who are interested in how production facilities are selected and specified:

- Subsurface engineers looking for a better understanding of production/processing facilities.

- Facilities/Process engineers looking for an entry level review of surface production facilities.
- Other technical professionals not directly involved in the design and operation of production facilities looking for an awareness of such facilities.

Oil Production & Processing Facilities

Basic Level (16 Weeks Duration)

Description

The emphasis of this course is on oil production facilities - from the wellhead to the delivery of a specification crude oil product to the refinery. Both onshore and offshore facilities will be discussed. Produced water treating and water injection systems are also covered. Solution gas handling processes and equipment will be discussed as well, though at a relatively high level. In addition to the engineering aspects of oil production facilities, practical operating problems will also be covered including emulsion treatment, sand handling, dealing with wax and asphaltenes, etc. Exercises requiring calculations are utilized throughout the course.

Who Should Attend

Process/facilities engineers, senior operating personnel, and chemists. Wide-ranging skills for design, operation and troubleshooting of oil and water production equipment.



05 - PROCESS FACILITIES

Process Utility Systems

Basic Level (16 Weeks Duration)

Description

This course will provide an overview of the various Utility Systems, key selection considerations and how they are integrated into onshore and offshore oil and gas facilities. Individuals will develop a basic understanding of the wide variety of utility systems and components and how they integrate with the process facilities and overall operation.

System selection, relative costs and other managerial decisions pertinent to utility operations are covered. Exercises are used to identify utility consumers, summarize utility requirements, consider high level utility systems options, and select the most energy efficient alternatives from an onshore and offshore perspective.

Who Should Attend

Facility Engineers or engineers new to utility systems who are responsible for designing, operating and maintaining utility systems in oil and gas processing and related facilities. Most operations and planning activities depend on a fundamental knowledge of utility systems.

This important subject is frequently overlooked however it is vital to successful oil and gas operations. Attending this course will assist participants in developing a broad background in utility systems.

Produced Water Treating

Basic Level (16 Weeks Duration)

Description

This course covers technical topics related to produced water operations and the required processing in upstream oil and gas operations. Typical produced water composition and physical properties are covered. Water quality requirements as a function of disposal method are addressed, including onshore processing, surface discharge, offshore discharge, and reinjection. Regulatory requirements and typical analytical test methods necessary to monitor and ensure regulatory compliance are covered.

Treatment theory is discussed, followed by practical application in selecting and operating typical water handling equipment.

Typical process flow diagrams are used to illustrate equipment selection, design features, layout and processes. Chemical treatment is also covered in this course.

Who Should Attend

Managers, engineers, chemists, and senior operations personnel who are responsible for designing, operating and maintaining oil and gas facilities that process produced water. This course will assist participants in developing a broad understanding of the technical aspects which are required to select, design, maintain, and troubleshoot produced water process equipment and systems.

Heat Transfer Equipment

Intermediate Level (26 Weeks Duration)

Description

This course reviews the selection, basic design, and operation of heat transfer equipment commonly used in the oil and gas industry with focus on E&P production facilities. Heat transfer equipment discussed will include shell and tube exchangers, compact heat exchangers, brazed aluminum exchangers, air coolers, and fired equipment.

Who Should Attend

Engineers & senior operating personnel involved in the design, specification, or operation of heat transfer equipment.

Onshore Gas Gathering Systems: Design & Operation

Intermediate Level (26 Weeks Duration)

Description

This course deals with the design, operation and optimization of onshore gas gathering systems and their associated field facilities, from the wellhead to the central gas processing facility. From a design perspective, the main variables that impact the flexibility and operational characteristics of an onshore gas gathering system will be discussed. Typical operating problems are covered including hydrates, multiphase flow issues, corrosion, declining well deliverability, etc. Exercises will be utilized throughout the course to emphasize the key learning points.



05 - PROCESS FACILITIES

Who Should Attend

Production & facilities department engineers/senior operating personnel responsible for the design, operation and optimization of onshore gas gathering systems and their associated field facilities

Relief and Flare Systems

Intermediate Level (26 Weeks Duration)

Description

The course begins with the need for pressure control/over-pressure protection, continues with the key engineering and design aspects including Code considerations, and concludes with selecting and defining the components of a relief and flare system. The material of the course is applicable to onshore field production facilities, pipelines, gas plants, terminals, and offshore production facilities.

Who Should Attend

Engineers & senior operating personnel responsible for designing, operating and maintaining relief and flare systems in oil and gas facilities

Separation Equipment - Selection & Sizing

Intermediate Level (26 Weeks Duration)

Description

This course covers the different types of separation equipment typically encountered in oil & gas production facilities. Fractionation equipment and produced water treating equipment are not covered in this course. You will learn where the different types of separation equipment

are used based on operating conditions and separation performance requirements. Frequent references will be made to real production facility process flow diagrams. Typical operational problems and their solutions will be discussed. Exercises requiring calculations are utilized throughout the course.

Who Should Attend

Process/Facilities engineers needing skills for design and troubleshooting of separators.

Troubleshooting Oil and Gas Processing Facilities

Intermediate Level (26 Weeks Duration)

Description

This course will cover how to establish and apply a general troubleshooting methodology as well as how to conduct process/equipment specific troubleshooting. Definitions of good/normal performance will be discussed for each process/equipment type covered. Data gathering, validation and utilization procedures will be discussed. Criteria to use when evaluating possible problem solutions will also be covered. Real-world exercises will be utilized throughout the class to reinforce the learning objectives. Both onshore and offshore facilities will be discussed. It is assumed that course participants have a solid understanding of how typical oil and gas production and processing facilities work, including the commonly used processes and equipment involved.

Who Should Attend

Process/Facilities engineers with 5-10 years of experience, Facilities Engineering team leaders/supervisors, Senior Facilities operational personnel.

CO₂ Surface Facilities

Advanced Level (39 Weeks Duration)

Description

This course emphasizes the affect of carbon dioxide on the selection and operation of equipment (separators, compressors, and dehydrators), as well as sweetening process equipment. This course, assists those working with carbon dioxide or high carbon dioxide content natural gas. This course is particularly applicable to those persons who operate and/or design enhanced oil recovery (EOR) facilities using CO₂ as a miscible agent.

Physical and thermodynamic property data for carbon dioxide/natural gas mixtures are discussed. Calculations are performed to illustrate principles and techniques.

Who Should Attend

Engineers and senior operating personnel involved with carbon dioxide/natural gas/CO₂ EOR systems.



06 - GAS PROCESSING

Gas Conditioning and Processing

Basic Level (16 Weeks Duration)

Description

This course deals with the practical planning, design, specification and operation of gas processing and production systems. The program is designed for both production and processing personnel. This course emphasizes the practical choice of equipment. Operating issues, performance evaluation and control systems are also discussed.

Who Should Attend

Production and processing personnel involved with natural gas and associated liquids to acquaint or reacquaint themselves with gas conditioning and processing unit operations. This course is for facilities engineers, process engineers, operations personnel, field supervisors and others that select, design, install, evaluate or operate gas processing plants and related facilities.

Gas Conditioning and Processing: LNG Emphasis

Basic Level (16 Weeks Duration)

Description

The course includes in-depth information on basic LNG gas conditioning and processing. Instructors will explain the acid gas removal processes employed in LNG processes. Relevant details of both the mixed refrigerant and cascade processes in LNG liquefaction are described.

Who Should Attend

Personnel involved with natural gas processing and LNG production, as well as anyone interested in a solid understanding of the principles of an LNG plant.

LNG: Technology and the LNG Chain

Basic Level (16 Weeks Duration)

Description

This LNG course is designed for participants requiring moderate technical coverage coupled with information on LNG commerce and all parts of the LNG Value Chain.

This course covers:

- Key commercial issues
- Technical LNG basics,
- Facility operation topics,
- Technical and design issues.

Selected exercises and syndicates are used throughout the course that reinforce the main topics of LNG trade and technology.

Who Should Attend

- Commercial and managerial staff
- Engineers new to the LNG industry
- Operations supervision staff
- Senior Plant personnel
- Specialists looking to broaden their knowledge
- Staff involved in LNG commerce

Overview of Gas Processing: Non-Technical

Basic Level (16 Weeks Duration)

Description

This course is designed for a broad non-technical audience. While the course is intended to be interactive and participatory, most technical calculations are eliminated and use of technical terminology is minimized. During this course participants will learn about Oil and gas facilities terminology, fundamentals of commercial and contract issues, key areas in oil and gas production surface facilities, non-technical fundamentals of technology and processes and various treatment processes and technologies that are selected for differing gas compositions.

Who Should Attend

General administration, supervisory, non-technical management personnel, as well as anyone that could benefit from a broad overview of important aspects of the gas processing industry.

Overview of Gas Processing: Technical

Basic Level (16 Weeks Duration)

Description

This course is an overview of the gas conditioning and processing industry. Natural Gas and World Energy Trends, Natural Gas, Gas Sweetening, Gas Hydrates and Dehydration, Phase Behavior and Phase Envelopes, Stabilization and Fractionation Concepts and Facilities, Gas Conditioning and NGL Extraction, Gas Processing Key Equipment and Support Systems and Specialty Processes in Gas Pro-



06 - GAS PROCESSING

cessing. This course is participative and interactive course that utilizes fundamental technical exercises and terminology to communicate key learning points.

Who Should Attend

As a wide ranging overview, it is suitable for “interested parties” more so than direct practitioners, such as geologists, reservoir engineers, line managers, sales and business development staff, related specialists such as environmental staff, operational staff, shift foremen, or those new to the industry such as entry-level engineers, as well as anyone interested in a general, technically oriented overview of the gas processing industry.

Process Safety Engineering

Basic Level (16 Weeks Duration)

Description

This course provides an overview of process safety engineering fundamentals for hydrocarbon processing facilities, with emphasis on the upstream oil & gas sector. The focus of this course is on the engineering/design aspects of Process Safety Management. Frequent reference will be made to historical incidents and recurring problem areas. Techniques for analyzing and mitigating process safety hazards applicable to oil and gas processing will be reviewed. Integration of the concepts covered to achieve a measured approach to Process Safety Engineering is a key aim of this course.

Who Should Attend

Facilities, process and design engineers, as well as new safety/loss prevention engineers who require an overview of Process Safety Engineering



Advanced Applications in Gas Processing

Intermediate Level (26 Weeks Duration)

Description

A basic working knowledge of the commercial process simulation package being used will provide the best opportunity to achieve the learning objectives of this course.

A comprehensive course exercise based on a typical gas processing facility which can be applied to either onshore or offshore facilities is used for this course.

The problem is developed in stages and at the completion of the course the participant will have developed a process simulation model that includes a dew point control process, a mechanical refrigeration process with economizers, hydrate inhibition using MEG, and NGL liquid product stabilization with recycle.

Who Should Attend

Engineers needing an intensive training in natural gas processing and associated liquids recovery processes with emphasis on the use and benefits of a simulation package.

Gas Treating and Sulfur Recovery

Intermediate Level (26 Weeks Duration)

Description

This course emphasizes process selection, practical operating issues, technical fundamentals, and integration of the sweetening facilities into the overall scheme of gas processing. Sulfur recovery and tail gas processes are also covered including standard Claus configurations, Super-Claus, EuroClaus, SCOT, etc. Special design and operation topics such as trace sulfur compound handling and the importance of H₂S:CO₂ ratio is covered. Related topics such as liquid product treating, corrosion, materials selection and NACE requirements will also be reviewed.

Who Should Attend

Production and processing personnel involved with natural gas treating and sulfur recovery requiring an understanding of the principles of these process operations. This course is for facilities engineers, process engineers, operations personnel, field supervisors and others who select, design, install, evaluate or operate gas sweetening and sulfur recovery facilities.



07 - WELL CONSTRUCTION / DRILLING & COMPLETIONS

Basic Drilling Technology

Basic Level (16 Weeks Duration)

Description

Equipment and procedures involved with drilling oil and gas wells are described for those who are interested in understanding the drilling process regardless of the academic background. In this course, the overall drilling process is presented along with definitions and descriptions of drilling equipment and various components are discussed in greater detail with explanations of the basic science concepts which guide these processes. Subjects include descriptions of drill bits, directional drilling, drilling fluids, solids control, cementing, casing, well bore stability, well control, measurement-while-drilling techniques, stuck pipe, lost circulation, and well bore hydraulics. Some technology enhancements are included to improve understanding of drilling operations for all participants, with or without a science background. An understanding of clay mineralogy helps understand well bore instability and drilling fluids. A discussion of pressure and pressure effects helps explain many of the procedures and problems associated with drilling wells. Rocks behave differently under pressure and understanding this behavior helps understand drilling performance. The art and science of drilling are explained in simple terms.

Who Should Attend

Petroleum and production engineers, completion engineers, geoscientists, managers, technical supervisors, service and support personnel, entry level drilling engineers, drilling operations personnel, drilling office support staff.

Casing and Cementing

Basic Level (16 Weeks Duration)

Description

This course builds a firm foundation in the principles and practices of designing, planning and conducting successful casing and cement jobs. The course uses a process-based perspective that takes participants from initial casing depth and size selection, casing and liner design procedures, casing running practices, planning and executing primary cementing, through remedial cementing and plugging operations. In addition to the necessary technical information and procedures, the course is laced with considerable practical, experience-based content.

Who Should Attend

Personnel responsible for planning, overseeing, and conducting casing and cementing operations; operator and service personnel

Coiled Tubing and Its Applications

Basic Level (16 Weeks Duration)

Description

This course provides an introduction to coiled tubing (CT) as a tool for workover and drilling and completion services. It includes an overview of CT extended-reach operations, typical field applications, the properties of CT, its manufacture, surface equipment required for downhole deployment, as well as discussion of downhole CT tools. A significant portion of course covers CT mechanical performance, including working limits, buckling and fatigue.

A discussion of CT drilling technology and hydraulics is also included.

Who Should Attend

Engineers and others that are involved in the design of CT equipment or uses of CT field services.

Drilling Fluids Technology

Basic Level (16 Weeks Duration)

Description

The course is designed for engineers and field personnel involved in the planning and implementation of drilling programs.

The seminar covers all aspects of drilling fluids technology, emphasizing both theory and practical application. Drilling is a complex operation requiring proper understanding of different technologies and disciplines. Today's drilling personnel must have a working knowledge of drilling fluid in order to effectively drill a well.

The course provides the fundamentals necessary to drill a well, whether it is a shallow well or a complex, high pressure well.

Who Should Attend

- Drilling supervisors
- Drilling engineers
- Tool pushers
- Managers and
- Technical support personnel involved with drilling operations in Oil & Gas Industries.



07 - WELL CONSTRUCTION / DRILLING & COMPLETIONS

Drilling Practices

Basic Level (16 Weeks Duration)

Description

The course is designed for engineers and field personnel involved in the planning and implementation of drilling programs. It covers all aspects of drilling technology, emphasizing both theory and practical application. The course provides all the fundamentals necessary to drill a well whether it is a shallow well or a complex, high pressure well. Computer programs are used to design many aspects of the modern well and the course will provide the participants with the theory behind most programs along with practical implementation.

Who Should Attend

Drilling supervisors, drilling engineers, toolpushers, managers and technical support personnel.

Fundamentals of Casing Design

Basic Level (16 Weeks Duration)

Description

Casing design is an integral part of a drilling engineer's work scope. This course provides a comprehensive overview of the design process, emphasizing the working stress approach currently used in the industry. On completion of this course, successful participants will be able to select casing points, identify tubular requirements and loads, and design and specify the required casing string. Through a combination of lecture and extensive hands-on examples, the fundamentals of casing design are imparted

to the attendees. Estimation of standard and special loads is covered in detail. Standard theories of strength and failure are discussed as well as advanced considerations for combined loads. In addition safe handling, running, and hanging practices are covered.

Who Should Attend

Drilling engineers, service personnel involved in developing well plans, and managers interested in learning about the well design process.

Intelligent Well Technology

Basic Level (16 Weeks Duration)

Description

This course presents the basic knowledge and fundamentals of intelligent well completions needed to identify, plan, and execute smart-well and smart-field projects. Participants will gain an understanding of the petroleum engineering considerations for intelligent well applications such as project screening, well performance modeling and reservoir simulation. They will also learn about the equipment, functionality, completion design and execution needed to successfully implement the project.

Who Should Attend

This course is intended for reservoir, production, drilling and completion engineers, managers and other personnel who are interested in learning about intelligent well technology and its potential applications.

Introduction to Drilling with Casing Technology

Basic Level (16 Weeks Duration)

Description

This fundamental course begins with an introduction to the DwC industry, key benefits of the technology, and the primary DwC systems employed by various operators. This is followed by selection of equipment for setting up a competent DwC system comprising of surface casing drive and handling equipment and downhole components. Various engineering calculations will also be discussed.

Who Should Attend

This course is intended for drilling engineers, drilling manager and field engineers who have limited exposure to drilling with casing technology or those professionals that are considering using this technology in future wells.

Introduction to Managed Pressure Drilling

Basic Level (16 Weeks Duration)

Description

This course provides a solid introduction to Managed Pressure Drilling (MPD), an adaptive drilling process that allows greater control of the annular pressure profile throughout the wellbore. Participants will learn the variables involved in MPD operations, including the selection of the equipment and the various aspects of safety and operations.

Who Should Attend

This course is appropriate for those who are new to the industry, or anyone who would like to understand the value



07 - WELL CONSTRUCTION / DRILLING & COMPLETIONS

of this important drilling technology.

Introduction to Under-balanced Drilling

Basic Level (16 Weeks Duration)

Description

This course covers the integrated technologies involved in underbalanced drilling. Participants will learn the operation of an underbalanced drilling project and be able to make informed selections of the equipment that is required. During this course participants will learn about: Objectives, limitations and advantages of under-balanced drilling, Selecting the right technique (air, mist, foam, aerated/gasified or single phase), Drilling fluid systems and surface equipment for under-balanced drilling, Reservoir studies, Completing under-balanced-drilled wells; Health, safety and environmental Issues and Case studies.

Who Should Attend

The course is designed for all personnel involved in under-balanced drilling, including:

- Onshore and Offshore managers,
- Wellsite engineers,
- Wellsite supervisors and
- Operations engineers.

Primary Cementing: Cementing I

Basic Level (16 Weeks Duration)

Description

Cementing is a key factor in the well construction plan. The base cement used in the designing of cement slurries may

or may not be API class cement. The operating company and the service company personnel should have a good working knowledge of cement slurry design, cement additives, and placement procedures. The majority of the operating companies do not have cement testing laboratories, therefore the laboratory testing is conducted by service companies.

This course is designed to give a good understanding of how the cement slurries are tested and under what conditions depending on given well parameters. This course will also cover casing hardware (both internal and external), cement blending, cement additive blending (dry and/or liquid), on-site mixing equipment and job execution on location. During this course participants will learn about: Basic cements, Cement additives, Laboratory testing, Casing hardware, Blending equipment, Mixing equipment, Primary cementing, Remedial cementing, Plug cementing.

Who Should Attend

Operating and service company personnel responsible for:

- Planning
- Designing
- Laboratory testing
- Overseeing and
- Executing cementing operations

Shale Selection, Completions, Fracturing and Production

Basic Level (16 Weeks Duration)

Description

The technology for recovering oil and gas reserves from shale is changing the face of the industry worldwide. Taking such issues in considerations this course acquaints

participants with the basics of oil and gas shale evaluation and current shale selection, well completion, fracturing, and production technologies for shale reservoirs. The interactive format includes field data, current approaches and use of technologies suited for shale developments. Technologies include logging, frac interval selection, multistage fracturing in horizontal wells, and a summary of field data from many shale plays.

During this course participants will learn about: Candidate selection criteria to identify shale "sweet spots", Complex fractures and role of geo-mechanics, Well orientation, optimum length and perf cluster design, Optimizing well completions and stimulations, Fracturing risk estimation: strengths and areas to improve; Water sources, treatment, reuse and disposal, Predicting production, estimating decline and well start-up suggestions; Surface equipment and production operations.

Who Should Attend

This course is for all well completion and production:

- Engineers,
- Managers and
- Geologists working with shale reserves.

Stuck Pipe Prevention

Basic Level (16 Weeks Duration)

Description

The Stuck Pipe Prevention - Train Wreck Avoidance workshop provides the most comprehensive coverage in the industry for understanding and preventing the underlying causes of Stuck Pipe, Wellbore Instability, Loss Circulation, and other sources of non-productive time (NPT) in



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drilling operations. The workshop also focuses on correct responses by individuals and teams, early warning signs, and minimizing the impact to drilling operations. Through world-class presentations, practical discussion, and the best reference and instructional materials available, delegates hone their knowledge of basic drilling technology and how it relates to avoiding NPT.

Who Should Attend

Entire drilling and completions team, including operator, drilling contractor, and service companies.

Well Design and Engineering

Basic Level (16 Weeks Duration)

Description

Well Design and Engineering integrates all major well design technologies from pre-spud to TD. Participants are actively engaged in every aspect of the technical activities required to deliver a cost-effective well plan while also gaining valuable perspective on how the overall process should be managed in a dynamic team environment. The content of this course is often customized to address technologies and practices that may be specific to a project or operational situation.

During this course participants will learn about: Trajectory design, Wellbore stability and casing point selection, Drilling fluids and solids control, Casing design, Primary cementing, Drill string and BHA design, Bit technology, Circulating system hydraulics and hole cleaning.

After completing this course participants will be able to identify trajectory design issues and their influence on

torque and drag, wellbore stability, and future intervention while being able to develop specific casing design skills including casing point selection; design load case development; burst, collapse and tension calculations; controlling load and safety factor determination and select appropriate size, weight and grade.

Who Should Attend

Drilling engineers, completion engineers, and drilling supervisors involved with drilling operations and well planning

Well Test Analysis and Design

Basic Level (16 Weeks Duration)

Description

Many operators who run bottom-hole pressure tests (BHP) do not understand what the tests are used for, and the factors that may affect the quality of BHP data. This has often resulted in some tests being invalidated or becoming almost useless to the company it is being run for despite huge sums of money spent on getting the data. The objective of this course is to teach participants the appropriate procedures for BHP surveys and analysis, and the role of each group involved in BHP test. During this course participants will learn about: Purpose and types of BHP surveys, BHP survey equipment, Ideal conditions for running tests and correct procedures for conduction tests, Field practices and other factors that affect tests, Examples of good and bad tests.

Who Should Attend

Wireline operators, BHP survey supervisors, engineers and technicians who need insight into BHP surveys & analysis.

Casing and Tubing Design

Intermediate Level (26 Weeks Duration)

Description

This course covers all the relevant subjects needed to understand the structural mechanics of downhole tubulars. Discussions begin with the fundamental design principles and progresses through materials, performance, loads and design. Participants will also learn to calculate tension, compression, burst collapse, yield and threshold strength.

Who Should Attend

This course is for drilling and completion engineers, and drilling supervisors who want additional insight into casing and tubing design.

Cementing Practices:

Cementing II

Intermediate Level (26 Weeks Duration)

Description

Cementing is a very important phase of the well construction plan. Operating company personnel must have a good working knowledge of cements, cementing additives and placement procedures. This course covers the importance being placed on the cement sheath integrity during the life of the well, requiring additional mechanical properties of the set cement be obtained other than the compressive strength. The parameters that the cement sheath will be subjected to must be considered. There are a number of joint industry projects addressing this area of work. The course covers the use of cement formulations, cement additives, casing hardware, cement blending, on-



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site mixing equipment and a well-planned job procedure. Cementing guidelines will be covered that aid in overall job performance.

During this course participants will learn about: The overall cementing operation, Primary cementing, Remedial cementing, Plug cementing, The use of cement additives, Laboratory testing, Casing hardware, Cement sheath integrity, Cement sheath evaluation, Mixing equipment, Special cement systems, Cement guidelines and Current documents.

Who Should Attend

This course is intended for operating company and service company personnel responsible for planning, overseeing, and executing cementing operations.

Directional, Horizontal, and Multilateral Drilling Intermediate Level (26 Weeks Duration)

Description

This course builds a firm foundation in the principles and practices of directional drilling, calculations, and planning for directional and horizontal wells. Specific problems associated with directional/horizontal drilling such as torque, drag, hole cleaning, logging and drill string component design are included. Participants will receive instruction on planning and evaluating horizontal wells based on the objectives of the horizontal well. The basic applications and techniques for multi-lateral wells are covered in the course. Additionally, they will become familiar with the tools and techniques used in directional drilling such as survey instruments, bottomhole assemblies, motors, steerable motors and steerable rotary systems. Participants will

be able to predict wellbore path based on historical data and determine the requirements to hit the target. During this course participants will learn about: Cementing, Applications for directional drilling, Directional profiles, Extended reach wells, Survey calculations and accuracy, Dogleg severity calculations and problems associated with doglegs, Planning directional and horizontal wells, Horizontal drilling methods and applications, Logging high angle wells, Hole-cleaning, Multi-laterals, Types of survey instruments, Tools used to deflect a wellbore, Torque and drag calculations.

Who Should Attend

Drilling, production and operations engineers, field supervisors, toolpushers, managers & technical support personnel.

Drill String Design and Optimization Intermediate Level (26 Weeks Duration)

Description

This course reflects the latest technology applications for both near-vertical and high-angle well designs while maintaining a thorough grounding in the fundamentals.

During this course participants will learn about: Drill String and BHA failure prevention, Low-Angle design applications, High-Angle design applications; Torque, drag, and casing wear mitigation, Vibration monitoring and avoidance, Drill string handling and inspection.

After completing this course participants will be able to place the drill string design process in context with other planning and operational considerations; Design

cost-effective BHAs; Gain specific application experience analyzing common load cases for both near-vertical and high-angle situations: Tension loads, Torque loads, Combined tension-torque loads, Fatigue loads, Buckling loads; Identify drilling tools and operational practices to reduce both torque and drag and casing wear; refresh underlying physics of drill string failures and mechanical properties of drill string materials; diagnose and mitigate vibration to reduce drill string damage and failure; optimize drill string inspection program using the latest industry standards.

Who Should Attend

Operator, drilling contractor and service company engineers, drilling supervisors and superintendents.

Geomechanical Aspects in CO₂ Storage Intermediate Level (26 Weeks Duration)

Description

This course is an overview of the essential geomechanical aspects to consider when assessing the suitability of a carbon storage site and maintaining the site safely over time. Participants will gain an understanding of the many factors that can affect the well, reservoir and caprock integrity of potential geological carbon storage sites.

During this course participants will learn about: Basic concepts of stress and strain, including mechanical and acoustic properties, rock strength, pore pressure and in-situ stresses; Geomechanical responses to CO₂ injection; Effective reservoir monitoring, including injection-induced microseismicity, and techniques for monitoring ground and subsurface deformations.



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Who Should Attend

This course is for engineers, researchers, geoscientists, technologists, and regulators involved in CO₂ sequestration.

Horizontal Well Completions

Intermediate Level (26 Weeks Duration)

Description

This course develops strategies for completing horizontal wells. It covers both cased-hole and open-hole configurations, either with or without sand control. Participants will learn the applications and dynamics of horizontal wells, including drill-in fluids, hole displacement, cementing, perforating, and stimulation.

They will also learn the guidelines for selecting stand-alone screens and executing horizontal gravel packs. During this course participants will learn about: Completion options, Cased-hole horizontal completions, Perforating and stimulating horizontal wells, Open-hole horizontal completions, Drill-in fluids, Zonal isolation and inflow control, Displacing the drill-in fluid.

Who Should Attend

This course is designed for drilling, completion & reservoir engineers, and for service company personnel involved with:

- Planning,
- Drilling,
- Completing and
- Operating horizontal wells.

Managing Wellsite Operations

Intermediate Level (26 Weeks Duration)

Description

Managing Wellsite Operations teaches participants to apply organizational learning processes, wellsite technical limits analysis and more efficient use of all resources at the wellsite. Participants will learn how to identify and mitigate hidden risks that often are overlooked during the planning, design and execution phases of a drilling operation. The participant will learn how to dissect and analyze an operational plan. In addition, applying operational innovations and advanced motion and time processes will lead to improved efficiency of wellsite rotary operations and individual wellsite tasks. Participants will be introduced to models, templates, techniques, and real case studies that can be used on the job.

During this course participants will learn to build effective teams by using a case study and applying the skills of the company representative, drilling contractor and service company personnel. Critical issues are identified and analyzed to maximize safety and reduce drilling costs. Similarly, engineering, technical service, and drilling contract personnel learn to analyze inefficient practices at the wellsite and utilize their newfound skills to improve the operation. Drilling organizations are using new and complex drilling technology to maximize return on capital costs. Combine the known variables with the influx of inexperienced personnel in the planning, design, and execution phases and you have high cost and unsafe operations at the wellsite. Mastering the drilling operations at the wellsite will reduce costs, improve drilling budgets and maximize resources.

Who Should Attend

Operations managers, drilling managers, drilling superintendents, drilling supervisors, wellsite drilling engineers, rig managers, rig superintendents, contract drilling engineers

Practical Drilling Skills

Intermediate Level (26 Weeks Duration)

Description

This course teaches how to listen to the well, perform simple tests on the rig, and make proper decisions unique to each well.

During this course participants will learn about: Interpretation of mud logger gas units, Determining pore pressure, On-site hydraulic optimization, Selecting proper bit loading for the fastest and cheapest hole, Interpreting pressure integrity tests; Hole problems (such as, stuck pipe, lost circulation, and ballooning), Borehole stability, Operating guidelines, Drilling fluid properties necessary to maximize drilling performance, Discussion of polymers in drilling fluids, Solids control equipment arrangement to assure best drilled solids removal.

Who Should Attend

Experienced people on drilling rigs who want to drill cheaper, specifically drilling rig personnel, drilling engineers, drilling rig supervisors, tool pushers, drilling managers, and service company personnel.



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Reservoir Aspects of Horizontal and Multilateral Wells

Intermediate Level (26 Weeks Duration)

Description

This course includes discussion on practical issues and reservoir parameters of horizontal well projects. The topics include formation damage, drainage areas, well spacing, well reserves, and rate calculations using steady-state and pseudo steady-state methods. The course includes several field case histories and performance analysis of horizontal wells. During this course participants will learn about: Drilling methods and costs, Well spacing and drainage areas, Recovery factors and steady-state solutions, Case histories: coning applications, Fractured horizontal wells and Forecasting production.

Who Should Attend

This course is for reservoir, production, drilling, and completion engineers and managers.

Cement Evaluation and Remediation

Advanced Level (39 Weeks Duration)

Description

This course examines methods for detecting fluid channels, voids and leaks, and how to repair them. Poor cement coverage affects nearly every aspect of a well. This course will give participants a better understanding of some critical well safety and integrity issues. It also covers the logging tools and technologies use to evaluate the integrity of the cement prior to initial completion or anytime during the life of the well.

Who Should Attend

This course is for drilling and completion engineers, field supervisors, petroleum engineers, and geologists as well as managers and regulatory officials who need to understand what can go wrong with a cement job and how it can be repaired.

Modern Well Design

Advanced Level (39 Weeks Duration)

Description

This course presents a unified approach to the well design process. It is an overview of the operational sequences, from spudding the well through drilling and completion, to startup and production. Participants will learn elementary rock mechanics and a simple way to analyze borehole stability. The information is then used to design a fracture gradient curve, which serves as input to the well design process.

That is followed by a discussion of the potential for optimization. During this course participants will learn about: Methods for improving borehole stability; High-pressure, high-temperature (HPHT) wells; Hydraulic optimization and the interpretation of ballooning in deep wells; Deep-water, multilateral and long-reach wells; Well integrity issues with examples.

Who Should Attend

This course is for drilling and production engineers, drilling supervisors, exploration geologists, and others who work on oil and gas wells.

Shale Oil and Tight Oil Technologies

Advanced Level (39 Weeks Duration)

Description

This course is intended for those who are very familiar with reservoir evaluation and development concepts for conventional reservoirs but who are interested in learning more about the unique technologies applied to Shale Oil and Tight Oil. During this course participants will review critical issues impacting well productivity, and forecasting, that are often over-looked and gain insights on the test and techniques for estimating oil composition and volumes

Who Should Attend

- Engineers,
- Geologists,
- Managers, and technical support staff.



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Solids Control Systems

Advanced Level (39 Weeks Duration)

Description

Drilled solids in a drilling fluid can, and usually do, cause many problems while drilling wells. Drilling fluids containing excessive drilled solids increase trouble costs or Visible Non-Productive Time [NPT]. These costs are usually easily visible because the drilling rig can no longer drill. Drilling performance can be impacted by drilled solids and, frequently, be unnoticed. This higher drilling cost penalty is frequently accepted as 'normal'.

Drilling performance is significantly affected by excessive drilled solids in the drilling fluid and might be considered an Invisible NPT. The Invisible NPT cost can be significantly larger than the Visible NPT. The list of problems created by drilled solids include stuck pipe, lost circulation, excessive wear on expendables, drill string vibration, poor cement jobs, low drilling rates, poor cuttings transport in the annulus, poor log interpretation, formation damage, creating a formation fluid influx by swabbing, and excessive expenditures for waste disposal. Each of these problems will be addressed during the course. Drilled solids are easier to remove when they are large. This means that solids control starts at the drill bit.

During this course participants will learn about: Analysis of different aspects of drilling which are affected by drilled solids, Solids transport capabilities of a drilling fluid, How shale shakers separate drilled solids, Types of motion of shale shakers, How hydro-cyclones and centrifuges separate drilled solids, How equipment should be arranged on a drilling fluid processing plant, Selecting the proper

centrifugal pump impeller, Mud tank agitation, Mud gun placement, Degasser operation and objective, Guidelines for effective drilled solids removal, Trip tank operation, Calculating Solids Removal Efficiency, Evaluating mud cake compressibility; Developing a thin, slick compressible filter cake in a well bore, drilling a well bore which allows casing to be moved while cementing, maintaining a homogeneous fluid to fill drill pipe.

After completing this course participants will understand how to: Evaluate the effect of drilled solids on the total cost of a well, Remove drilled solids expeditiously from beneath the drill bit, Transport drilled solids to the surface, Arrange each component of a drilling fluid processing plant for proper performance, Evaluate each component of a drilling fluid processing plant, Determine the Equipment Solids Removal Efficiency of the system, Understand the new API RP 13C (Solids Control), Evaluate the effect of drilled solids on drilling fluid properties and Minimize drilling fluid discarded for Waste Management.

Who Should Attend

Only people interested in eliminating non-productive time while drilling; such as:

- Drilling engineers,
- Drilling rig supervisors,
- Tool pushers,
- Drilling managers,
- Operating company personnel and
- Reservoir engineers.



08 - MECHANICAL

Rotating Machinery Best Practices

Basic Level (16 Weeks Duration)

Description

This is an intensive course providing a comprehensive overview of pumps, compressors, steam turbines, lubrication systems, seals and other machinery and practices related to rotating machinery. Best practices from a variety of rotating machinery topics, representing many years of collective experiences, are presented in this course. The focus is on equipment and system best practices- type, unit and station configuration, integration of these units in the process scheme and control strategy in upstream and midstream oil and gas facilities. The material of the course is applicable to all oil and gas field production facilities, refineries, pipelines, gas plants, marine applications and offshore systems.

Who Should Attend

Engineers, senior technicians and system operators designing, operating and maintaining rotating equipment in oil and gas facilities.

Fundamentals of Pump and Compressor Systems

Intermediate Level (26 Weeks Duration)

Description

This course provides a comprehensive overview of pumps and compressor systems. The focus is on equipment selection - type, unit and station configuration, integration of these units in the process scheme and control strategy in upstream and midstream oil and gas facilities.

The material of the course is applicable to field production facilities, pipelines, gas plants, and offshore systems.

Who Should Attend

Engineers, senior technicians and system operators designing, operating and maintaining pump and compressor systems in oil and gas facilities.

Piping Systems: Mechanical Design and Specification

Intermediate Level (26 Weeks Duration)

Description

This course for engineers and piping system designers reviews the key areas associated with the design of piping systems for oil and gas facilities.

The course is focused on four areas:

- Codes and standards,
- Pipe materials and manufacture,
- Piping components, and
- Piping layout and design.

Following applicable piping codes are integral parts of this course's content:

- Oil and gas facilities,
- Pipe sizing calculations,
- Pipe installation, and
- Materials selection.

Who Should Attend

Mechanical, facilities, plant or pipeline engineers and piping system designers who are involved in the design of in-plant piping systems for oil and gas facilities.

Process Plant Reliability and Maintenance Strategies

Intermediate Level (26 Weeks Duration)

Description

This course is designed to teach Reliability Engineering skills as they apply to improving Process System Reliability and developing maintenance strategies. During this course participants will understand analysis methods to perform statistical analysis of failures, model system performance, and develop maintenance and reengineering strategies to improve overall performance.

Who Should Attend

Maintenance, engineering and operations personnel involved in improving reliability, availability, condition monitoring, and maintainability of process equipment and systems. Participants should have foundation skills in statistical analysis and reliability techniques for equipment.

Risk Based Inspection

Intermediate Level (26 Weeks Duration)

Description

The risk-based approach requires a systematic and integrated use of expertise from the different disciplines that impact plant integrity. These include design, materials selection, operating parameters and scenarios, and understanding of the current and future degradation mechanisms and of the risks involved.

Risk-Based Methodologies enable the assessment of the likelihood and potential consequences of equipment fail-



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ures. RBI (Risk-Based Inspection) provides companies the opportunity to prioritize their equipment for inspection; optimize inspection methods, frequencies and resources and develop specific equipment inspection plans. This results in improved safety, lower failure risk, fewer forced shutdowns, and reduced operational costs.

Who Should Attend

Inspection maintenance, production and other plant engineers and technicians responsible for the safe on-going operation of pressure containing equipment in oil and gas facilities.

Troubleshooting Rotating Equipment

Intermediate Level (26 Weeks Duration)

Description

This course provides a comprehensive understanding of rotating equipment failures and reliability. Condition monitoring techniques are discussed and evaluated. Scenarios involving common rotating equipment reliability issues: rotors, journal bearings and vibration, thrust bearings, balance drums, pump mechanical seals, compressor seals (liquid and dry gas) and auxiliary systems are presented.

The material of the course is applicable to all oil and gas field production facilities, refineries, pipelines, gas plants, marine applications and offshore systems.

Who Should Attend

Maintenance, engineering and operations personnel involved in troubleshooting reliability, analysis, condition monitoring, and maintainability of rotating equipment and related systems.

Compressor Systems: Mechanical Design and Specification

Advanced Level (39 Weeks Duration)

Description

This course provides basic knowledge of compressor types and associated auxiliary systems, mechanical design of equipment, operating and performance characteristics, control and monitoring systems, maintenance practices, and codes and standards.

Who Should Attend

Mechanical, facilities, plant, or pipeline engineers and technicians needing an in-depth understanding of the different types of compressors.

Turbo-machinery Monitoring and Problem Analysis

Advanced Level (39 Weeks Duration)

Description

This course focuses on defining the systems and subsystems that form the **turbomachinery**, the potential problems with these systems and subsystems, monitoring techniques for early detection of problems, and methods to analyze the monitored variables to detect potential problems or reconstruct reasons for failures.

Who Should Attend

Experienced mechanical or facilities engineers and senior technicians needing an understanding of monitoring and troubleshooting turbomachinery.

Gas Turbines

Advanced Level (39 Weeks Duration)

Description

This course focuses on defining the systems and subsystems that form the **gas turbines**; the potential problems with these systems and subsystems; monitoring techniques for early detection of problems; and methods to analyze the monitored variables to detect potential problems or reconstruct reasons for failures.

Who Should Attend

Experienced mechanical or facilities engineers and senior technicians needing an understanding of operations, control, monitoring and troubleshooting gas turbines utilized in the oil and gas industry.



09 - PRODUCTION

Hydraulic Fracturing - A Concise Overview

Basic Level (16 Weeks Duration)

Description

This course includes the fundamentals of hydraulic fracturing along with addressing the general process, the terminology, and many of the real-world problems—in a concise format. The overall emphasis is how hydraulic fracturing fits-in with, is impacted by, or impacts geologic concerns, reservoir engineering, and operations. It will provide a general familiarity with fundamentals of the complete hydraulic fracturing process. That is, why it works (or doesn't), where is it applicable, and what to consider in order to improve.

Who Should Attend

The course is intended for engineering managers, petroleum engineers, geologists, geophysicists, reservoir engineers desiring general information about the process, and what it can do for them.

Introduction to Distributed Temperature Sensing (DTS)

Basic Level (16 Weeks Duration)

Description

This course is an introduction to the emerging technology of Distributed Temperature Sensing (DTS), and a historic look at the reasons behind the need for DTS and its usage to date. The course looks at how DTS technology has been applied and the reasons behind applying this technology.

Such systems have found application in high-cost horizontal and multilateral wells where reentry with a logging tool is difficult if not impossible.

Who Should Attend

This course is for petroleum engineers, geologists and anyone else interested in learning more about DTS and the latest advances in the technology.

Introduction to Hydraulic Fracturing

Basic Level (16 Weeks Duration)

Description

This course will provide introductory information on all aspects of knowledge relating to hydraulic fracturing, from the history of fracturing, design, execution, evaluation, and also recent advances in horizontal staged fracturing, which is widely used in unconventional resources like shale gas.

Participants will obtain the understanding of design, execution and evaluation process of hydraulic fracturing and knowledge of the critical parameters dictating the success of hydraulic fracturing. The course will also cover the concept and difference between conventional and unconventional fracturing process.

Who Should Attend

The upstream O&G engineers/managers who have not been involved in hydraulic fracturing operations but would like to get some insight on this particular discipline.

Overview of Microseismic Imaging of Hydraulic Fracturing

Basic Level (16 Weeks Duration)

Description

This course is a survey of microseismic imaging of hydraulic fracturing. It is designed to give the attendees a rudimentary understanding of this technology based on the science at its foundation, the means and methods by which it is carried out, and the benefits it brings to the users. Since this technology is interdisciplinary, combining geophysics, geology, and geomechanics with well completion technologies, the goal of the course is to give attendees the knowledge and realistic expectations of microseismic imaging of hydraulic fracturing. To this end attendees should expect to become knowledgeable & discerning users, evaluators, and questioners of those vending this technology.

Who Should Attend

Any oil and gas professional interested in hydraulic fracturing and diagnosis would benefit from this course.

Production Optimization using NODAL Analysis

Basic Level (16 Weeks Duration)

Description

NODAL analysis views the total producing system as a group of components potentially encompassing reservoir rock/irregularities, completions, vertical flow strings, restrictions, multilateral and branches. It will identify bottle necks and serves as a framework for the design of efficient field wide flow systems, including wells, artificial lift, gathering lines and manifolds.



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Together with reservoir simulation and analytical tools, nodal analysis is used in planning new field development.

Who Should Attend

Production, operations, and reservoir engineers, production technologists, senior technicians and field supervisors with an engineering background.

Transient Well Testing

Basic Level (16 Weeks Duration)

Description

This course is designed to teach state-of-the-art design and interpretation of pressure transient testing through hands-on examples and exercises from oil and gas fields. The course describes the detailed process from well-testing selection and design to data acquisition, validation, and interpretations for different types of reservoirs. Information about the latest developments in pressure transient analysis such as testing under multiphase flow conditions, layered reservoirs, and numerical analysis.

Who Should Attend

This course is for production and reservoir engineers and Earth scientists involved in well and formation characterization and reservoir surveillance.

Artificial Lift Systems

Intermediate Level (26 Weeks Duration)

Description

This course will help develop a solid foundation in all forms

of lift and the concepts of the selection process to maximize production and return on investment. Troubleshooting is an important part of artificial lift operations and several typical surveillance problems are solved. Participants learn how to design and troubleshoot rod pumping, continuous gas lift, and electric submersible pump systems. Other methods such as PCP, plunger lift, jet pump, hydraulic pump, and intermittent gas lift will also be addressed. With increased prices, more emphasis is placed on techniques to maximize production. New developments at various stages of application are also covered.

Who Should Attend

This course is for production and field operations engineers, junior and senior petroleum engineers and field technicians as well as geoscientists and reservoir engineers.

Formation and Prevention of Oilfield Scale: From the Laboratory to the Field

Intermediate Level (26 Weeks Duration)

Description

This course introduces state-of-the-art oilfield scale management, with field examples to illustrate the basic science. This course draws very strongly on the extensive experience gained from the industry and underlying theory in an accessible manner along with concrete practical examples of how this knowledge is applied in the field. During this course participants will get knowledge of background to mineral scale formation in oilfields, scale prevention using chemical scale inhibitors, theory of scale inhibitor squeeze treatments, the design of field scale management programs and the impact of the reservoir on the field scaling problem.

Who Should Attend

This course is for production technologists, engineers, oil-field chemists and anyone concerned with flow assurance issues. It is also useful for those who work in the service, scale inhibitor and sulphate industries.

Hydraulic Fracturing Fundamentals for Shale

Intermediate Level (26 Weeks Duration)

Description

This course covers the technical fundamentals of hydraulic fracture design treatments in shale reservoirs. During this course participants will be introduced to Shale reservoir characteristics, Well design and completion basics, Five Fracture treatment objectives, Hydraulic fracturing mechanics, Pre-treatment calibration tests and Fracturing fluid options and applications.

The primary focus is on actual field results, the practical data needed to plan a treatment, and the reasons treatment designs vary by company and by type of shale reservoir.

Who Should Attend

This course is intended for those involved in the oil and gas industry who have little to no exposure to fracture treatment design but require additional information to help support or guide design and treatment activities.



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Hydraulic Fracturing: Design and Treatment

Intermediate Level (26 Weeks Duration)

Description

This course covers the fundamental principles concerning how hydraulic fracturing treatments can be used to stimulate oil and gas wells. This course includes discussions on how to select wells for stimulation, what controls fracture propagation, fracture width, etc., how to develop data sets, and how to calculate fracture dimensions. During this course participants will get knowledge of Rock mechanics/in-situ stress aspects of fracturing, Reservoir aspects of fracturing, Fracture mechanics, Fracture design variables, Perforating for fracturing and Fracture diagnostics.

The course also covers information concerning fracturing fluids, propping agents, and how to design and pump successful fracturing treatments.

Who Should Attend

Production and completion engineers and field operations staff with basic to moderate knowledge or experience in designing, pumping or evaluating hydraulic fracture treatments can benefit from this course.

Hydraulic Fracturing/Pressure Analysis

Intermediate Level (26 Weeks Duration)

Description

This course presents the basics of analyzing fracturing pressure, including design parameters that can be determined, and the uses and limitations of such analysis for on-site design. During this course participants will get knowledge

of In-situ stresses and fracture geometry, Determining closure pressure and analyzing pressure decline, Interruption of bottom-hole treating pressure, Fluid efficiency and the fluid loss coefficient, pressure vs. fracture height growth-stress profile, Scheduling proppant and fluid from pressure decline data. Sessions include real-world examples from a variety of wells, from tight gas and shale to high permeability, offshore, and frac-pack treatments.

Who Should Attend

This course is for petroleum engineers who are involved, either directly or indirectly, in the design and evaluation of hydraulic fracturing treatments.

Well Test Interpretation

Intermediate Level (26 Weeks Duration)

Description

This course examines the fundamentals of well test interpretation for oil and gas wells. It covers the analysis of tests in vertical and horizontal wells: drillstem tests, wireline formation tests, flow/build-up tests, injection/fall-off tests interference/pulse test. Determination of permeability and damage, estimation of stabilized flow rates from short tests, detection of boundaries etc. The practice of well test interpretation will be emphasized along with the theory.

To this end, Data Validation and the PPD (Primary Pressure Derivative) will be used to illustrate Wellbore Dynamics, and extricate these effects from the reservoir response. The concepts will be presented graphically, thus keeping equations to a minimum. The practical aspects of the interpretation process will be highlighted.

Who Should Attend

Reservoir and production engineers. This course is also suitable for engineers new to well testing.

Well Treatment and Stimulation

Intermediate Level (26 Weeks Duration)

Description

This comprehensive course covers the full spectrum of well treatment and stimulation options for carbonate and sandstone reservoirs. It begins with a review of the various mechanisms that can damage a formation and ways to avoid them.

Next, the discussion turns to acid systems for carbonate and sandstone formations, treatment design the selection of additives, and the use of coiled tubing in extended reach and multilateral wells. The course will end with an introduction to new technologies for carbonate acidizing. Case histories illustrate some of the treatment options.

Who Should Attend

This course is for production, drilling, completion and reservoir engineers who are responsible for enhancing the performance of wells.



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Cased Hole and Production Log Evaluation

Advanced Level (39 Weeks Duration)

Description

This course covers wireline diagnostic techniques for the surveillance of cased wells. During this course participants will learn about: Formation evaluation through casing, Well integrity - cement and casing inspection, Water identification and fluid movement in both injection and producing wells.

Who Should Attend

This course is for reservoir & production engineers and geologists, petrophysicists, log analysts and others involved in well surveillance, maximizing recovery, identifying production problems, planning workover operations or utilizing production information in reservoir studies.

Design and Optimization of Artificial Lift Systems

Advanced Level (39 Weeks Duration)

Description

This course is an in-depth look at artificial lift, specifically for wells using continuous-flow gas lift or electrical submersible pumps (ESPs). During this course participants will get understanding of production systems, role of artificial lift in optimizing production, analysis and trouble shooting of continuous-flow gas lift systems, ESP with detailed pump, motor, cable and shroud designs, handling of gas and solids.

Who Should Attend

This course is for engineers who are involved in oil production and the design, maintenance and optimization of artificial lift, especially electrical submersible pump and continuous-flow gas lift systems.

Diagnosis and Practical Solutions for Wellbore Fluid- and Heat-Flow Problems

Advanced Level (39 Weeks Duration)

Description

This course examines the fluid flow and heat transfer that occurs down hole during the production of oil and gas. During this course will understand fluid & heat-flow models, applications to fluid flow assurance and applications to the reservoir surveillance.

Participants will learn how to compute the pressure and temperature profiles of single- and multi-string completions, and for both conduits of gas-lift wells. These basic principles will then be extended to tackle flow assurance and reservoir surveillance problems using examples from the field.

Who Should Attend

This course is designed for production, reservoir and flow-assurance engineers who are involved in the development of oil or gas reserves and the simulation of integrated systems.



10 - INSTRUMENTATION & ELECTRICAL

Electrical Engineering Fundamentals for Facilities Engineers

Basic Level (16 Weeks Duration)

Description

This course applies fundamental electrical engineering principles to oil and gas facilities design and operation. Through the use of individual and group problem solving, attendees will learn about transformers, motors, generators, one-line diagram interpretation, protection and co-ordination of electrical equipment, emergency power, site and standby generation, electrical safety, and hazardous areas. Participants will gain a better understanding of electrical components and systems and will develop a greater appreciation for electrical engineering.

Who Should Attend

Facilities and Project Engineers as well as new Instrumentation, Controls and Electrical Engineers who need to improve their basic understanding of electrical systems within oil and gas facilities.

Instrumentation and Controls Fundamentals for Facilities Engineers

Basic Level (16 Weeks Duration)

Description

This course applies fundamental instrumentation and control engineering principles to oil and gas facilities design and operation. Through the use of individual and group problem solving, attendees will learn about field measurement devices, final elements and actuators, pressure relief and regulation, documentation, programmable logic controllers, power supplies, SCADA, DCS, SIS, hazardous areas,

and installation methods. Participants will gain a better understanding of instrumentation and control components and systems and will gain a greater appreciation for instrumentation and control engineering.

Who Should Attend

Facilities and Project Engineers as well as newly graduated Electrical, Controls and Instrument Engineers who need to improve their basic understanding of instrumentation and control systems within oil and gas facilities.

Instrumentation, Controls and Electrical Systems for Facilities Engineers

Basic Level (16 Weeks Duration)

Description

This course provides an overview of electrical power generation and distribution, process and safety systems instrumentation, and control strategies and configurations. During this course the focus is on teaching participants about practical application and integration into the process and control of upstream and midstream oil and gas facilities. The material of the course is applicable to field production facilities, pipelines, gas plants, and offshore systems.

Who Should Attend

Managers, engineers, technicians and system operators requiring a broad understanding of instrumentation, control, and electrical systems in oil and gas facilities.

Flow and Level Custody Measurement

Intermediate Level (26 Weeks Duration)

Description

This course is designed to acquaint users with the problems and solutions associated with the need for high accuracy transfer of liquid and gas petroleum products from supplier to customer. These needs have been brought about by major changes in manufacturing processes and because of several dramatic circumstantial changes such as: the increase in the cost of fuel and raw materials; the need to minimise pollution; and the increasing pressures being brought to bear in order to adhere to the requirements for health and safety.

Who Should Attend

This course is specifically tailored for any personnel who are, or will be, responsible for designing, selecting, sizing, specifying, installing, testing, operating and maintaining instrumentation related to the field of custody level and flow transfer measurement. This could include facilities, process, chemical, electrical, instrumentation, maintenance, and mechanical engineers and technicians.

PLC and SCADA Technologies

Intermediate Level (26 Weeks Duration)

Description

This workshop provides engineers and technicians with the basic theoretical and practical understanding of PLC and SCADA systems. It traces the evolution of the PLC as an intelligent 'black box' replacement for the relay panel and



10 - INSTRUMENTATION & ELECTRICAL

how, with the advent of modern communications architectures, it is combined with supervisory control systems to allow stand-alone control systems to be configured. Throughout the course, participants will learn through active participation using exercises and questionnaires covering: basic ladder logic programming; hardware diagnostics; and implementation of various communication strategies.

Who Should Attend

Instrumentation, electrical and process engineers and technicians involved in selecting, sizing, specifying, installing, testing, operating and maintaining programmable logic controllers (PLCs) and supervisory (SCADA) systems

Regulatory Control and PID Loop Tuning

Intermediate Level (26 Weeks Duration)

Description

This course provides instrumentation, automation and process engineers and technicians with the basic theoretical and practical understanding of regulatory control systems and how this can be applied to optimize process control in terms of quality, safety, flexibility and costs. Participants will learn through active participation using exercises, questionnaires, and a series of practical simulation sessions covering: process reaction; tuning methods; diagnostic tools; affect of different algorithms; surge tank level control; analysis of such problems as valve hysteresis, stiction and non-linearities and the impact on controllability; and integral windup.

Who Should Attend

Instrumentation, automation and process engineers and technicians involved in specifying, installing, testing, tuning, operating and maintaining regulatory PID control systems.

Valve and Actuator Technologies

Intermediate Level (26 Weeks Duration)

Description

This course provides a total in-depth insight into valve and actuator technology covering: control valves, check valves, shut-off valves, solenoid valves, and pressure relief valves. A methodology is presented to ensure the optimum selection of size, choice of body and trim materials, components, and ancillaries. Whilst studying both liquid and gas valve sizing, participants will also learn the correct procedures for calculating the spring 'wind-up' or 'bench set'. Maintenance issues also include: testing for dead-band/hysteresis, stick-slip and non-linearity; on-line diagnostics; and signature analysis. During this course, participants will learn through active participation using exercises, questionnaires, and practical sessions covering: systems choice; basic sizing calculations; computer-based sizing; and maintenance diagnostics.

Who Should Attend

Facilities, instrumentation, maintenance, and mechanical engineers, technicians, chemical and electrical involved in designing, selecting, sizing, specifying, installing, testing, operating & maintaining shutoff, pressure relief and control valves.



11 - HSEQ

Basics of HSE Management

Basic Level (16 Weeks Duration)

Description

Recognition and proper management of health, safety and environmental risks is fundamental to all management and professional roles in the industry. This course aims to equip participants with the underpinning knowledge relating to the concepts of an effective HSE management system and the key elements required for successful implementation. The course is based upon a common HSE management system model and the program explains the basic elements and their interaction.

Who Should Attend

For all staff in the oil & gas and petrochemicals industries requiring a basic awareness of health, safety and environmental (HSE) management systems including; Operations, Engineers, Supervisors, Project managers and aspiring HSE professionals.

Basics of Safety

Basic Level (16 Weeks Duration)

Description

Recognition of safety related risks is fundamental to all management and professional roles in industry. This course equips participants with basic principles of hazard recognition, and use of safety techniques and safety management.

Who Should Attend

For all staff in the oil & gas and petrochemicals industries requiring a basic awareness of safety techniques and management including: operations, engineers, supervisors, project managers, safety representatives and non-safety HSE professionals.

Basics of Health

Basic Level (16 Weeks Duration)

Description

This course provides an overview of health hazard identification, health risk assessment and the basics of health impact assessments. The course covers essential basic knowledge on ergonomics, human factors engineering, food and water hygiene, and thermal extremes. Other important issues covered include health and emergency response facilities, psychological and social impact and fitness for duty and how these relate to the oil and gas industry. During this course participants will learn about Health Risk Assessment, Health Impact Assessment, Human factors engineering, Ergonomics, Health and medical emergency facilities, Fitness for duty, Food and water hygiene, Thermal extremes, Medical surveillance/industrial hygiene, Psychological and social agents.

Who Should Attend

Non-health professionals in the Oil & Gas and petrochemicals industries requiring a basic awareness of health, industrial hygiene and medical issues in the workplace. These personnel may include: HSE professionals, operations, managers, engineers, supervisors, project managers.

Basics of Environment

Basic Level (16 Weeks Duration)

Description

Our program starts in advance of the taught course, as participants undertake a review of their own site's environmental performance using documentation supplied to them. This sets the context for this course, which comprises a blended learning approach with tutorials, workshops, problem-solving and practical activities. During this course participants will learn about Environmental Management, Environmental Audit, Environmental Impact Assessments (EIA), importance of Sustainability, principles and sources of environmental information, purpose and importance of setting environmental policy, main sources of water pollution and methods to reduce contamination of water sources, importance of techniques for minimizing waste, risks associated with contaminated land, potential sources and consequence of environmental noise and why emergency preparedness and response are necessary.

Who Should Attend

Staff in oil, gas and petrochemicals industries who require the basics of environmental management and pollution control, including operational staff, engineers, supervisors, project managers and entry level HSE professionals. It is a core course for any person who can influence environmental impact within their organisation; it is also an ideal program for anyone new to the industry with no prior environmental knowledge. This course is a first step on a career ladder towards a role within the environmental disciplines.



11 - HSEQ

Applied HSE Management

Basic Level (16 Weeks Duration)

Description

This course is about practising and applying HSE management for the oil & gas and petrochemicals industries. A rich variety of exercises, readings, videos and case studies are used to support the learning in realistic situations. During this course participants will learn about Leadership & commitment, Policy & strategic objectives, Legislation & regulation; Organization, responsibilities & resources, Professional training & behaviors, Risk assessment & management, Planning & procedures, Contractor controls, Security, Emergency response, Performance management, Incident reporting & investigation, Audit and Management review. After completing this course participants will be able to successfully apply the principle elements of an HSE management system. This course will enable participants shape and improve the safety culture of the organisation.

Who Should Attend

- HSE Professionals,
- Operations,
- Engineers,
- Supervisors and Project managers and
- All staff who have the responsibility for designing, implementing, or supporting HSE management.

This is a core course for persons in a supervisory role in an operational environment. Some prior knowledge of HSE management related topics is desirable but not essential.

Applied Safety

Basic Level (16 Weeks Duration)

Description

This course is about practising and applying safety tools, techniques and management for the oil & gas and petrochemicals industries. A rich variety of exercises, readings, videos and case studies are used to support the learning in realistic situations. These come together to “challenge” participants in the real life scenario of a fictional facility and concludes with the participants defending to the regulator why the company should maintain its operating licence. After completing this course participants will be able to design and implement the principles and practice of safety technology. They will be able to apply factors relating to people, equipment, materials and the working environment to the establishment of safe working environments and identify common hazards and design and implement systems to control and monitor them.

Who Should Attend

- HSE Professionals,
- Operations,
- Engineers,
- Supervisors and Project managers and
- All staff who have the responsibility for designing, implementing, or supporting HSE management.

This is a core course for persons in a supervisory role in an operational environment. Some prior knowledge of HSE management related topics is desirable but not essential.

Applied Health

Basic Level (16 Weeks Duration)

Description

This course builds on practical experience and learning on health and industrial hygiene, and intends to build skills to allow participants to be able to apply these techniques within their respective roles. During this course participants will study Health risk assessment, Health impact assessment, Human Factors Engineering, Ergonomics, Health & medical emergency facilities, Fitness for duty, Food and water hygiene, Thermal extremes, Medical surveillance/ industrial hygiene, Psychological and social agents. The course is set in a fictitious, but highly realistic, case study based, where management needs assistance to develop a health management system. Application of other essential issues and how they relate to the oil and gas industry is also covered - ergonomics, human factors engineering, food and water hygiene, and thermal extremes. Other important issues which are covered include health and emergency response facilities, psychological and social impact and fitness for duty.

Who Should Attend

For all staff who have the responsibility for designing, implementing and/or supporting health and industrial hygiene programs in the workplace in conjunction with professional health practitioners including: HSE professionals, managers, engineers, supervisors, project managers. Some prior knowledge of health related topics is desirable but not essential.



11 - HSEQ

Applied Environment Basic Level (16 Weeks Duration)

Description

This course provides opportunities to apply the tools, techniques and management systems of environmental management in petrochemicals industries. Participants work as a member of a team of environmental specialists to develop and improve the Environmental Management System and environmental performance of a fictitious but highly realistic case study. The course is designed to introduce participants to a range of environmental challenges, including policy development, conducting environmental reviews, tackling environmental issues including waste management, energy efficiency, pollution control and emergency planning, environmental monitoring and becoming an "agent for change" in their own organisations. During this course participants will learn about Effective application of Environmental Management Systems, Assessing environmental impact, Environmental risk management, Developing environmental improvement programs, Pollution control, Emergency preparedness and response, Environmental communication, Environmental performance monitoring, Environmental auditing, Environmental reporting and Management review.

Who Should Attend

This is a core course for persons with potential operational impact on the environment including environmental professionals, health and safety professionals wishing to broaden their skills, operational managers, engineers, supervisors, project managers and other staff.

Contractor Safety Management Basic Level (16 Weeks Duration)

Description

An effective relationship between clients and contractors at all stages of the procurement / supply chain is essential for competently managing health and safety in a hydrocarbon (or any) facility. This course provides the practical processes for developing and managing a contractor safety management system covering all stages of the contracting cycle based around recognized management systems. During this course participants will learn about Supply chain strategy, Management systems, Pre-qualification, bidding, evaluation criteria, appointment; Communication and Supply chain performance monitoring, interviewing skills, auditing.

After completing this course participants will be able to Implement a contracting supply chain strategy based on an understanding of the risks and benefits of outsourcing low risk, high risk and specialist activities and prepare a program to initiate the use of competent contractors based on bid documents covering HSE and other relevant standards.

Who Should Attend

- Project managers,
- Procurement and supply chain managers,
- HSE managers,
- HSE auditors,
- Engineers, and
- Supervisors who require an understanding of how to manage contractors.

Risk Based Process Safety Management Basic Level (16 Weeks Duration)

Description

This course introduces the concepts of process safety management in the oil and gas industry, the elements and benefits of process safety management systems, and tools for implementing and managing a system. Process safety is vital to the oil and gas industry.

A comprehensive process safety management system involves almost every function of a company: management, research, development, engineering, facility and process construction, operations, maintenance, human resources, information technology and the contractors used in the industry. In this course the participant will learn to use tools and techniques for managing process safety.

Throughout the course, participants will be challenged to think how their process safety management system can be enhanced and modified to meet the concepts of risk-based decision making. An individual action plan will be developed to provide guidance in applying the information from the course to the workplace.

Who Should Attend

- HSE professionals,
- Engineers,
- Supervisors and
- Project managers requiring a basic foundation in developing and managing process safety.



11 - HSEQ

Environmental Management Systems: A Development Workshop

Intermediate Level (26 Weeks Duration)

Description

This course provides the learning and comprehensive pre-built templates for developing and implementing an ISO 14001-based EMS for participants' own facilities.

During this course participants will learn Risk and the environment, Management systems and ISO 14001, Environmental policy and strategic vision, EMS planning - aspects, impacts, legal and other requirements; Resources and training; Communication, documentation and document control, Monitoring and measurement; EMS auditing and continual improvement.

Participants are encouraged to bring a site plan, and process flowcharts, which will be used in a series of hands-on exercises throughout the class. You will leave the class with a developed, draft EMS manual. The course includes all the documentation and materials necessary for preparing an EMS.

Who Should Attend

- Environmental managers, advisers and co-ordinators,
- Procurement and Supply Chain Managers,
- HSE Managers,
- HSE Auditors,
- Engineers and other managers and supervisors from large and small organisations who require the skills and support to develop a recognised environmental management system (EMS) for their organisation.

GHG and CCS Regulatory and Legal Frameworks

Intermediate Level (26 Weeks Duration)

Description

This course reviews the evolving regulatory and legal frameworks that will govern Green House Gases (GHG) and the emerging field of Carbon Capture and Storage (CCS). As with any industrial activity, CCS will require various operating rules. In this course, participants will gain an understanding of the broad legal framework that defines the day-to-day operating procedures of the industry.

Who Should Attend

This course is for oil and gas professionals, executives, managers, regulators and attorneys who need to understand the basic legal and regulatory framework that is shaping the emerging CCS industry.

Offshore and Onshore Oil Spill Prevention, Control and Countermeasures

Intermediate Level (26 Weeks Duration)

Description

This course focuses on oil spill or discharge prevention and response to spill during oil well drilling, production, and work-over operations. Participants will learn about oil spill or discharge prevention, response to spill, spill containment, air and water monitoring, hazard evaluation and introduction to oil spill trajectory model simulation. Participants will also learn to develop a plan that meets legal regulations.

Who Should Attend

This course is for engineers, managers, technicians, and

consultants responsible for designing and operating offshore and onshore drilling, production, or work-over facilities.

SHE Auditing: A Management Systems Approach

Intermediate Level (26 Weeks Duration)

Description

Participants work as a member of a team of internal auditors to appraise the Health, Safety and Environmental Management Systems (HSE-MS) of a fictitious but highly realistic case study. During this course participants will undertake Learning and Development: Risk management and business control, HSE-MS Auditing, Planning the audit, Review and test processes, Effective interviewing for information, Legal aspects relevant to auditing, Findings and recommendations, Audit conclusion, Audit interviews, Gathering objective evidence, Preparing the audit report, Audit team meetings, Closing meeting, Audit report and follow-up. The class is based firmly in the principles of corporate responsibility for risk management and business control, and the theory and practice of modern risk-based auditing. After completing this course participants will be able to participate effectively in an audit or review team in line with the standards of the auditing profession.

Who Should Attend

Experienced environmental managers and advisors. The participant will have responsibility for managing one or more environmental impacts within his/her work.



A photograph of a large industrial refinery or chemical plant. The scene is dominated by several tall, white distillation columns and a complex network of silver-colored pipes and metal structures. In the background, two red cranes are visible against a clear blue sky. The foreground shows a black metal fence. The left side of the image is partially covered by a yellow graphic element with a white, arrow-shaped cutout containing the text.

Accelerated Courses

12 - ACCELERATED COURSES

Gas Processing

Accelerated Course (52 Weeks Duration)

The Gas Processing Progression covers equipment and processes primarily focused on the handling of natural gas and its associated liquids. The wellhead is the starting point, ending with delivery of the processed gas, meeting the required specifications, into a sales gas or reinjection pipeline. The NGL may be fractionated into individual specification products or sold as a mix for fractionation elsewhere. Waste by-products are disposed of in accordance with the applicable regulatory requirements. Main topics covered include: fundamentals, natural gas characterization, phase behavior, vapor-liquid equilibrium, basic thermodynamics, and water-hydrocarbon behavior and all the key equipment to process natural gas.

Training Modules Includes:

- Gas Conditioning and Processing
- Gas Treating and Sulfur Recovery
- Troubleshooting Oil and Gas Processing Facilities
- Process Utility Systems
- Fundamentals of Pump & Compressor Systems in Oil and Gas Facilities
- Piping Systems: Mechanical Design and Specification
- Process Safety Engineering
- Corrosion Management in Production/Processing Operations
- Onshore Gas Gathering Systems: Design & Operation
- Heat Transfer Equipment
- Relief and Flare Systems
- Instrumentation, Controls & Electrical Systems for Facilities Engineers
- Project Management for Engineering and Construction
- CO2 Surface Facilities
- Overview of Offshore Systems
- LNG: Technology and the LNG Chain

Process Facilities

Accelerated Course (52 Weeks Duration)

Process Facilities separate the well stream into three phases - oil, gas and water and process these phases into marketable products or dispose of them in an environmentally acceptable manner. Gas handling/processing facilities are a major part of Process Facilities, and are covered in detail as Gas Processing elsewhere in this catalog.

Process Facilities, as used here, will mainly include: Single-well, satellite & central tank batteries, including: Oil treating: Stabilization, Separation equipment, Desalting - Storage, Produced-water treating facilities, , Water injection facilities, Offshore topsides facilities and Corrosion management.

Training Modules Includes:

- Oil Production & Processing Facilities
- Instrumentation, Controls & Electrical Systems for Facilities Engineers
- Process Utility Systems
- Gas Conditioning and Processing
- Process Safety Engineering
- Piping Systems: Mechanical Design & Specification
- Relief and Flare Systems
- Corrosion Management in Production/Processing Operations
- Fundamentals of Pump & Compressor Systems in Oil and Gas Facilities
- Onshore Gas Gathering Systems: Design & Operation
- CO2 Surface Facilities
- Overview of Offshore Systems
- Project Management for Engineering and Construction



12 - ACCELERATED COURSES

Offshore Engineering

Accelerated Course (52 Weeks Duration)

JOS provides technical training and consulting for the complete life-cycle of offshore oil and gas systems; from exploration and development to decommissioning. The curriculum includes courses that provide attendees the knowledge to understand and participate in evaluating the major offshore development alternatives: fixed structures, floating systems and subsea systems. Other key elements stressed in all offshore courses include life-cycle costs, constructability, operability and interface management. Offshore instructors have extensive real world experience managing offshore development projects, well construction and servicing, asset management and producing operations. Their broad knowledge blends the unique technical and operational issues of offshore into an integrated approach to enhance understanding of the full scope of offshore facilities.

Training Modules Includes:

- Fundamentals of Offshore Systems: Design and Construction
- Instrumentation, Controls & Electrical Systems for Facilities Engineers
- Process Utility Systems
- Relief and Flare Systems
- Piping Systems: Mechanical Design & Specification
- Gas Conditioning And Processing
- Fundamentals of Subsea Systems
- Fundamentals of Pump and Compressor Systems
- Oil Production And Processing Facilities
- Process Safety Engineering
- Fundamentals of Onshore and Offshore Pipeline Systems
- Project Management for Engineering and Construction
- Corrosion Management in Production/Processing Operations

Pipeline Engineering

Accelerated Course (52 Weeks Duration)

JOS provides technical training and consulting for oil and gas transportation, focusing on pipeline systems as well as onshore infrastructure systems that support oil and gas operations. The curriculum covers pipeline transportation systems, oil and gas terminal facilities, and the onshore infrastructure from regional considerations through design and construction of site-specific systems. As with all our training programs, these discipline areas integrate with the other technical, operations and HSE disciplines. The Instructors and Consultants that support the Pipeline discipline have extensive real world – global experience from conceptual development through operations. Their broad knowledge blends the unique technical and operational issues of pipeline systems that transport all types of fluids: from heavy oils to refined products to high pressure injection gas and water, into integrated systems. This global experience spans the pipeline industry from initial site selection through detailed design and construction of unique facilities.

Training Modules Includes:

- Fundamentals of Onshore and Offshore Pipeline Systems
- Piping Systems: Mechanical Design & Specification
- Overview of Subsea Systems
- Fundamentals of Pump and Compressor Systems
- Process Safety Engineering
- Corrosion Management in Production/Processing Operations
- Onshore Gas Gathering Systems: Design and Operation
- Overview of Offshore Systems
- Terminals and storage Facilities
- Oil Production and Processing Facilities
- Instrumentation, Controls & Electrical Systems for Facilities Engineers
- Gas Conditioning and Processing





Construction
Works

02 - CONSTRUCTION WORKS

JOS offers clients unparalleled expertise, attention to detail, and on-time, on-budget delivery through a highly talented workforce.



- Construction, Testing and commissioning for Oil & Gas Field facilities including pipelines, trunk lines, process piping and facilities.
- Oil and Gas Processing plant.
- Crude oil and products storage tanks up to 500,000 barrels in capacity.
- Construction & refurbishment of accommodation blocks suitable to desert conditions according to BS, ASTM, and ACI standards.





Maintenance
Works

03 - MAINTENANCE WORKS

JOS uses professional personnel; proven, flexible procedures; and advanced systems to execute only optimum solutions for its simple to complex projects.



- Maintenance/Repair and Revamping works for Oil & Gas Field facilities such as Stationary and Rotating equipments, Separators, Desalination plant, Boilers, Skimmers, Dehydrators, Scrubbers, Gas Boots and Production Tanks, etc. and assorted equipments.
- Repair / Maintenance of underground cross country pipeline up to 42 inch in diameter.
- Maintenance of crude oil storage tanks and various product storage and utility tanks. Activities include repair and replacement of tank appurtenances, bottom plate and roof plate, supply of foam dam seal plate and weather shield for floating roof tanks, etc.
- Maintenance / repair of oil / gas pipelines up to 42" inside diameter.
- Cleaning inspection of pipelines up to 42" inside.





Design & Engineering
Services

04 - DESIGN & ENGINEERING SERVICES

JOS strives to provide world class Design and Engineering Services that add value to the individual processes, complex operations, and entire project.



We can prepare following document such us:

- Pipe diagram
- Instrument diagram
- Flow diagram
- Piping layout
- Electrical cables connection
- Electrical cables distribution
- Material List
- Project Schedule and Cost.





Oil & Gas Materials
Supply Services

05 - OIL & GAS MATERIALS SUPPLY

Our vision

JOS's Oil & Gas Materials Supply unit's vision is to become a leading distributor of world's most recognized brands for Oil & Gas Materials.

Our Mission

To achieve its vision, JOS's Oil & Gas Materials Supply unit defines its mission as to become competitive in offering a complete package of quality products for Line Pipe, Tubing, Casing, Fittings, Valves, Fixtures, Overhead Line (OHL), Steel Poles, Steel Lighting Poles, Floodlighting Systems while focusing on improving customer's satisfaction through after sale services while ensuring that all imported products are supplied with Mill Test certificates.

Our Objectives

To execute our mission properly, we are focused on:

- Building strong supply-chain and developing long-term professional relations with major manufactures and regional distributors.
- Building Vast inventory and wide distribution
- Building highly experienced and knowledgeable staff
- Importing high quality products at competitive prices
- Building In-house technicians servicing what we sell
- Quick and efficient delivery
- Latest products on display in our showrooms

Our Values

- Determination
- Professionalism
- Knowledge
- Teamwork
- Technology

Overview

JOS is an emerging importer and exporter for Seamless pipes, Seamless Pipes, Hydraulic Tubes, Boiler Tubes, ERW Pipes/Welded Pipes, Pipes Fittings, Flanges & Casing and Tubing's for Wells etc. It imports Oil & Gas pipe and fitting from leading manufactures in the industry from Europe, U.S.A. , Canada and other countries. JOS's management has proven experience in importing Oil & Gas material from overseas. It imports leading brands from manufacturing plants and major warehouse in Japan, Germany, Italy, Romania, Spain, Brazil other countries. JOS ensures that its all imported products are supplied with Mill Test certificate such as EN 10204 3.1 / 3.2(2004 EDITION), further JOS can supply such material under witness of third-party inspection agencies.

We do our best to arrange the right material in right time at a very competitive rate. All of our products are sourced from world's Best mills, to name a few: Tenaris Dalmine (Italy), Sumitomo Corporation (Japan), JFE Steel Corporation formerly known as Kawasaki (Japan), V&M - Vallourec (Germany), Hyndai HYSCO (Korea), Productos Tubulares (Spain), Inox Tech (Italy), Salzgitter Mannesmann Stainless Tubes formerly Mannesmann DMV Stainless (Italy), T.T.I. Tubacex (Spain), ArcelorMittal Tubular Products Holdings BV formerly Mittal Steel Roman, Tubos Reunidos (Spain), Pietra S.P.A. (Italy), Kobe Steel, Ltd. (Japan), Mittal Iscor, etc.

JOS does its best to provide materials in right time at a very competitive rate to the clients. We are in position to provide & supply with different material such us:

- Piping & fitting in different material & grade
- Gasket & sealing check
- Valves (Ball, Gate, etc.)
- Insulations.

Note: material to be controlled by international standard & specification requirement such as API, ESMI, ASTM & B.S



Procurement Services

Pipes

JOS is an emerging distributor of steel pipe, tubing, and related steel products including round bar, steel plates and fittings in Libya. JOS is always striving for excellence in supplying what its customers need in steel products. It offers an extensive product range in sizes, grades, and coatings to meet your pipeline requirements. JOS stocks both domestic and import pipe for its own inventory as well as its customers. It stocks and distribute steel pipe in a variety of types, grades and sizes, offering both new and used products. JOS maintains a stock of new, surplus, and used steel pipe in its storage locations throughout Libya in order to handle client's requirements quickly and efficiently. JOS can offer "value added" services such as coating, cutting, midwelding and other light fabrication. JOS can offer following types of Pipes for Oil & Gas Industries anywhere in Libya:

New & Used Steel Pipe

Surplus Pipe

Steel Pipe Piling

Casing Pipe

Steel Casing Pipe

Steel Casing

Pipe Piling

Pipe Piles

Steel Pipe Piles

Piling

Caissons

Seamless Steel Pipe

Stainless Steel Piping

Line Pipe

Dock Pilings

Steel Tubing

Stainless Steel Tubing

Culvert Pipe

Sluice Pipe

Structural Pipe



Procurement Services

Line Pipe

Line pipe is a type of steel pipe that is used for transporting materials through pipelines across the country. Line pipe can be used to transport petroleum, natural gas, oil, and water. It is a durable pipe that must meet certain specifications and regulations. This pipe typically has a high strength and durability in order to withstand high pressures.

Line pipe is a type of pipe that is manufactured from high strength carbon steel. Line pipe can be used to build pipelines that transport a variety of resources including natural gas, oil, petroleum, and water. This pipe is available in a variety of diameters ranging from 2 inches to 48 inches. Line pipe can include either seamless or welded carbon steel or stainless steel piping.

Because line pipe needs to withstand high pressures, there are important tests done on line pipe to ensure it meets all of the requirements of steel chemistry, strength, toughness, and dimensional characteristics. Using line pipe that meets the set criteria will ensure safe and reliable pipeline service.

As an emerging pipe distributor, we are not only able to supply new line pipe directly from stock or mill sources, but we can also cut pipe to your required length and add special coatings as needed.

At JOS, we sell and distribute line pipe in a complete variety of sizes, lengths, diameters, and grades. We can deliver line pipe and other stainless steel piping to nearly any worksite or location throughout Libya.



Procurement Services

Stainless / Steel Tubing

Stainless steel tubing is typically measured by its outer diameter and can be used in a variety of applications including a number of structural applications. Stainless steel tubing is extremely durable and able to withstand corrosion. Thus tubing will not rust, even if exposed to the elements, heat, and other extreme conditions. Because of these factors, stainless steel tubing can be used for a wide variety of applications. Stainless steel tubing has a number of uses in a wide variety of industries. It can be used during manufacturing in processing plants or can become part of a final product. Stainless steel tubing can also be used in pipelines to transport oil, gas, water, or chemicals.

Our provided stainless steel tubing can be used in a variety of industries, including but not limited to: Machinery Parts, Food and Beverage, Processing, Pharmaceutical, Biotechnology, Automotive, Marine, Construction, Chemical, Oil and Gas. At JOS, we sell and distribute a variety of types and sizes of stainless steel tubing. We carry both seamless and welded stainless steel tubing including hot finished seamless, cold drawn seamless, and welded stainless steel tubing. We can cut this tubing to any required length. We offer stainless steel tubing in a variety of grades including 304, 316, 317, 321, 309, and 347 as well as some 400 grade series.

JOS sells and distributes a variety of types of stainless steel tubing that's why we can offer following major types of Steel Tubing: Carbon Steel Tubing, Alloy Steel Tubing or Stainless Steel Tubing. Whether you need a large order or a small one, we can supply the stainless steel tubing that you need to complete any project. We offer the delivery of our stainless steel tubing to any location in Libya and can quote delivered prices for any order.



Procurement Services

Casing Pipe

Casing Pipe is typically used to enclose and surround a carrier pipe, which is installed through the center of this pipe that's why it is also known as encasement pipe. Steel casing pipe is most often used in underground construction projects to encase or protect utility lines from being damaged. This pipe can be used when boring horizontally or directionally under roads, rivers, lakes, or railroads. In general, steel casing pipe is extremely durable and versatile, and therefore, it can be used in a variety of construction projects as well. Because steel casing pipe is extremely durable and available in a variety of sizes, this pipe can also be used in a variety of other applications. Casing pipe can be used for: Road Bore Casing, Water Well Casing, Culverts Casing, Open Cut Casing, Oil and Gas Transmission Pipeline Casing, Drilling Casing, Surface Casing, Rathole Casing, Tunnel Casing. Casing pipe is most often used to protect underground utility lines including water mains, electrical high-voltage lines, natural gas lines, telephone lines, and fiber-optic communication lines. This steel casing protects lines from human activity such as drilling or digging as well as from natural elements. The strength of the steel is a major advantage to the protection of these lines. Casing Pipe is available in a complete variety of different sizes and diameters as well as in straight seam, spiral-weld, and rolled and welded types of manufacture. At JOS, we sell both new and used casing pipe as well as imported and domestic steel casing pipe. We can supply casing pipe in 20 foot lengths or we can custom cut or splice pipe to meet your specifications. We can also supply casing pipe in bare, uncoated condition or with OD/ID coatings such as bitumastic and coal tar epoxy coatings. JOS can deliver any major type of Steel Casing, such as: Straight Seam Steel Casing Pipe, Spiral Welded Steel Casing Pipe or Rolled and Welded Steel Casing throughout Libya at your project's location.



Procurement Services

Fittings / Flanges

Fitting is used in pipe plumbing systems to connect straight pipe or tubing sections, to adapt to different sizes or shapes, and for other purposes, such as regulating or measuring fluid flow. Whereas Flanges refer to internal or external ribs that are meant to be a part of the pipe that processes oil. Pipe flanges also include the rims and lips of the pipe that gives it strength and durability. JOS is specialized in supplying of Pipe Fittings and Flanges of various specifications, size, grade and materials. Our supplies include:

- Standard grade Couplings
- Sockets
- Nipples
- Bushings
- Nuts, Caps, Plugs and Socket and Hose fittings, etc.

Apart from High Yield Fittings and Flanges, Line Stop Fittings, Compression Fittings, Fittings, Sanitary Fittings JOS can also provide different types of Fittings, i.e. :

- **Forged Fittings:** ASTM A-105 ASTM A-182 F-304, F304L, F-316, F-316L 150#, 300#, 2000#, 3000#, 6000#
- **Weld Fittings:** Various OD & WT: A-234 WPB Carbon Steel NACE A-403 WPS, WP, WPX 304L, 316L A-774 304L, 316L Socketweld Fittings for high pressure systems
- **Thread Fittings:** High quality fittings made of premium tube and bar material for high pressure system

JOS supplies all steel grades and pressure classes according to ANSI, API, BS, standards. Our regular supply includes all types of flanges, Lap-joint, Slip-on, Welding neck and Blind flanges in standard grades.

Pipe Fixtures

Rigs, pipes and oilfield tubular are vulnerable to corrosion, cracking, third-party damage and manufacturing flaws. JOS's solutions detect defects and discontinuities before they cause serious damage, assuring smooth operation and reducing financial risks.

JOS offers specialized services, with expertise throughout repairs and upkeep, including pipeline rehabilitation and pipe support implementation. It provides competitive products and services for pipefittings and fixtures in Oil and Gas Industries in Libya.

Our imported solutions are custom engineered composite systems for the purposes of pipe repair and restoration of pipe operating at elevated temperatures, can benefit clients in Oil and Gas industries.

Our solutions are designed and tried upon repair defects such as internal and external corrosion, dents, gouges and fabrication defects in accordance with international standards. Our solutions are ideal for oil and gas pipeline repair.

JOS offers affordable, long-lasting defense solutions against corrosion with premier mechanical protection for pipelines. Our solutions offer benefits such as faster setting time, easy application, unobtrusive profile and impact resistance.

As an emerging company that strongly believes in usage of state-of-art technologies and industry proven knowledge that offers rig, pipe and oil tubular safety and maintenance services, you can rest assured that your project is in safe hands.



Procurement Services

Actuators & Valves

JOS supplies a wide range of flow control system, actuators, valve products and parts for oilfield, refinery, petrochemical plant, marine and industrial applications according to API 6A, 6D specification for various pressure classes and sizes and applications. JOS can supply following types of **actuators**:

Actuator Accessories

Automation Accessories

Electric Actuators

Linear Electric Actuators

Rotary Geared Actuators

Hydraulic Actuators

Rotary Mechanical Actuators

Linear Mechanical Actuators

Rotary Pneumatic Actuators

Rotary Servo Actuators

Electric Limit Switches

Limit Switches

Lock Switches

Motor Operators

Pneumatic Actuators

Position Indicators

Positioners

Solenoids and Switches Valves

Apart from supplying actuation for Oil & Gas industries in Libya, JOS can supply wide variety of corrosion resistant high pressure application valves and parts and supply best quality **valves** that are both reliable and repairable, such as:

2-3 Way Jacketed Valve

Actuation

Angle Seat Valves

Angle Valves

API 6A & 6D Gate Valves

Ball Diaphragm Valves

Ball Valves for all Applications

Bleed Valves

Butterfly Float Valves

Check Valves

Choke Valves

Control Valves

Diaphragm Valves

Distribution Manifolds

Double Block Valves

Double Sealing Actuated Valve

Drain Valves

Dual Plate Check Valves

Externally Pressure Controlled

Foot Valve

Force Pilot Operated Valve

Gas and Air Valves

Gate Valves

Globe Valves

High Integrity Globe

Instrumentation

Safety & Environmental

Sampling

Slurry

High Pressure Valves

High Temperature Valves

Instrument Control Valves

Butterfly Valves

Isolation Valves

Knife Gate Valves

Manifold and Gauge Valve

Modular Valves

Mono Flange Valves

Motorized Valves

Multi Valve Manifolds

Needle and Plug Valve

Needle Valves

Pinch Valves

Piston Check Valves

Plug Valves

Pneumatic Actuator

Pressure Reducing

Pressure Regulating Valve

Pressure Seal Valves

Relief Valves

Safety Valves

Solenoid Valves

Storm Valves

Sub-Sea Valves

Wedgeplug Valves

And other kind of Valves





JOS offers solutions
for Overhead Line (OHL) that are
manufactured based on industry proven technologies.



Procurement Services

Transmission Towers

Transmission lines carry electricity over long distances at high voltages, typically between 115 kV and 765 kV (115,000 volts and 765,000 volts). Transmission towers support the high-voltage conductors of overhead power lines, from the generating station switchyard right up to the source substations and satellite substations located near populated areas. Their shape, height and sturdiness depend on the stresses to which they are exposed. JOS offers comprehensive consulting, engineering and delivery services for all phases of electric power transmission and distribution. Based on project's technical requirements JOS can offer wide variety of Transmission Towers with desired circuit configurations, include but not limited to:

- Avalanche Tower
- Dead-end Tower
- Double-Circuit Tower
- End Frames
- Guyed Cross-Rope Suspension Tower
- Guyed-V Tower
- Lattice steel guyed/self supporting towers (LST)
- M-type suspension towers
- Self-supporting Towers
- Tension towers
- Tubular Steel Pole (TSP)
- Tubular Towers
- V-type suspension towers
- Waist-Type Tower
- Wood Pole H-frames and Wood Poles



Procurement Services

Distribution Transformer

A distribution transformer is a specific type of transformer that provides the final voltage transformation in the electric power distribution system, stepping down the voltage used in the distribution lines to the level used by the customer. Based on their usage they can be generally classified into two categories, i.e. **Pole-mount transformers** and **Pad-mount transformers**. Distribution transformers normally have ratings up to 200 kVA, although some national standards can describe units up to 5000 kVA or more as distribution transformers. JOS imports wide range of transformers for the power industry that are used in substations by electric utilities. Our provided transformers are manufactured by GE Prolec, Siemens, Westinghouse, ABB, Alstom, HICO, Fortune and many other leading brands. We can offer different kinds of Distribution Transformers for Overhead Power Transmission, including:

- SDT / DST Small Distribution Transformers
- CRT Cast Resin Transformers
- DTH Dry Type Transformers H class insulation
- LDT Large Distribution Transformers
- MPT Medium / LPT Large Power Transformers
- Power Transformers
- Residential Single-Phase Pole-Mounted / Pad-Mounted Transformers
- Commercial Three-Phase Pad-Mounted Transformers
- Multitap Industrial Transformers

Our imported Distribution Transformers provide the necessary power for systems and buildings on the last transformation step from the power station to the consumer while ensuring that the operation remain highly reliable and efficient.



Procurement Services

Substations and Switchyards

Construction of substations and switchyards

JOS works with clients to successfully manage all phases of substation and switchyard construction. We have the resources and experience to deliver turn-key, ground-up solutions for alternative and direct-current stations (from 500kV and down), but are also adept at installing, testing, and connecting prefabricated equipment. Our experienced teams utilize cutting edge technologies and deep industry knowledge to design specifications and drawings, schedule projects, manage quality control, and ultimately ensure the safety and success of each project we take on which may including following services:

- Concept Design
- Economic Evaluations
- Substation Physical Design
- Grounding Design
- Bus Design
- Lightning Protection
- Equipment Specification
- Civil/Structural Design
- Gas Insulated Substation Design
- Protection & Control Design
- Wiring Design
- SCADA Design

Importing services for substation equipment

JOS imports different types of Electrical Substation equipment from leading brands in the industry which are manufactured based on industry proven technologies and contemporary engineering knowledge. JOS's imported substation equipment include but are not limited to: Transmission substation, Distribution substation, Collector substation, Converter substations, Switching substation.



Procurement Services

Switchgear

In an electric power system, switchgear is the combination of electrical disconnect switches, fuses or circuit breakers used to control, protect and isolate electrical equipment. Switchgear is used both to de-energize equipment to allow work to be done and to clear faults downstream.

JOS provides switchgear solutions developed by leading manufactures in the industry for the worlds most demanding power requirements - from leading traction networks to industrial applications.

JOS offers a broad range of Distribution switchgear solutions which can be appreciated throughout the distribution network, such as but not limited to:

- HV Substation Switchgear
- Low Voltage Switchgear
- Overhead Line Switchgear
- Indoor DC Switchgear
- Outdoor Switchgear

Be it energy supply corporations, industry or power stations, any owner or user of electrical distribution systems for places high demands on the switchgear. These include reliable technology, ease of operation and economy. With JOS's provided complete range of circuit breaker and switchgear systems for varying voltage ranges, clients will remain comfortable when it comes to reliable and efficient solutions for special requirements.



Procurement Services

Overhead Line Cables

Either you need AAAC, ACSR, ACSS, or any other overhead transmission conductor for specific nature of your project; EUROSTAR can help you in every step from line design to installation to technical support. JOS can provide you broad range of Overhead Line Cables but not limited to:

#	Overhead Line Cable Type	CODE
1	All Aluminium Alloy Conductors	AAAC
2	All Aluminum-Alloy Conductor (6201-T81)	AAAC-6201
3	All-Aluminium Conductors	AAC
4	Shaped Wire Compact Concentric-Lay-Stranded Aluminum Conductor	AAC/TW
5	Aluminum Alloy Conductor Steel Reinforced	AACSR
6	Aluminium Conductor Alloy Reinforced	ACAR
7	Aluminum Conductor Steel Reinforced	ACSR
8	Aluminium Conductor Aluminium Clad Steel Reinforced	ACSR/AS
9	Shaped wire Aluminum Conductor, Steel Reinforced	ACSR/TW
10	Aluminum Conductor Steel Supported	ACSS
11	Aluminum Conductor Steel Supported / AS Core	ACSS/AS
12	Aluminum Conductor Steel Supported / AW Core	ACSS/AW
13	Shaped Wire Compact Concentric-Lay-Stranded Aluminum Conductor, Steel-Supported	ACSS/TW



Procurement Services

Insulators

An insulator is a material whose internal electric charges do not flow freely; therefore make it very hard to conduct an electric current under the influence of an electric field. The term insulator refers to insulating supports used to attach electric power distribution or transmission lines to utility poles and transmission towers. Insulators are used in electrical equipment to support and separate electrical conductors without allowing current through themselves. They support the weight of the suspended wires without allowing the current to flow through the tower to ground. JOS can supplies insulators suitable for all overhead line applications ranging from low voltage using one piece service insulators to cap or pin type disc insulators for medium and high voltage usages, such as:

- Cap & Pin Disc Insulators
- Conductor Rail Insulators
- Insulator Pins
- Low Voltage Insulators
- Pin Insulators
- Shackle Insulator
- Stay Insulator
- Staywire Insulators
- Strain Insulator
- Suspension Insulator
- Toughened Glass Disc Insulators

JOS ensures that its all provided insulators for overhead line applications are manufactured based on industrial standards for delivering optimal desired results.



Procurement Services

Insulator Fittings

JOS offers a comprehensive range of insulator fittings to suite all type of line constructions and voltages ranging from distribution up to 500kV or more. Standard fittings are embraced within the available range together with the newer and more specialized items now require for Twin, Triple and Quad conductor configurations using the larger AAAC conductors. Our products are created by leading manufactures with superior quality to ensure that devices can be used for board application. JOS ensures that its provided devices such as Fittings with ball, socket coupling, clevis, tongue fittings and locking devices are in accordance with international standards. Our Insulator Fittings range include but are not limited to:

- Arcing Horns, Corona Shields & Rings
- Ball Ended Fittings
- Links & Plates
- Sag Adjuster Sets & Maintenance Links
- Shackles
- Socket Ended Fittings
- Yoke Plates

JOS provides a broad range of galvanized miscellaneous fittings which are used in a variety of applications. These include:

- Turnbuckles,
- Eye bolts,
- Dropper plates,
- Tower swivels,
- Anchor attachments and many other specialized items.



Procurement Services

Conductor Accessories

JOS offers a comprehensive range of conductor fittings and accessories to suit the majority of conductors in common use and also some of the more specialized conductors, such as: Matthew, Sycamore, etc. Our range of conductor accessories and fittings include suspension clamps, bolted and integral compression anchor clamps, wedge clamps, mid-span joints, repair sleeves, non tension joints spacers, tee connectors, etc.

JOS also offer a wide range of more specialized conductor accessories such as bi-metallic connectors, both pin and palm type, earth bonds, parallel groove clamps, angled and straight jumper terminals suitable for bi-metallic connections.

In summary for growing needs of Overhead Line Transmission projects, JOS offers following conductor accessories based on international standards:

- BI-Metallic Connectors
- Compression Dead End Clamps
- Jumper & Suspension Clamps Weights
- Jumper Connectors/Palms
- Line Termination Fittings
- Mid-Span & Non-Tension Joints
- Non-Tension Joint Spacers
- Repair Sleeves
- Suspension Clamps
- Vibration Control
- Wedge Clamps



Procurement Services

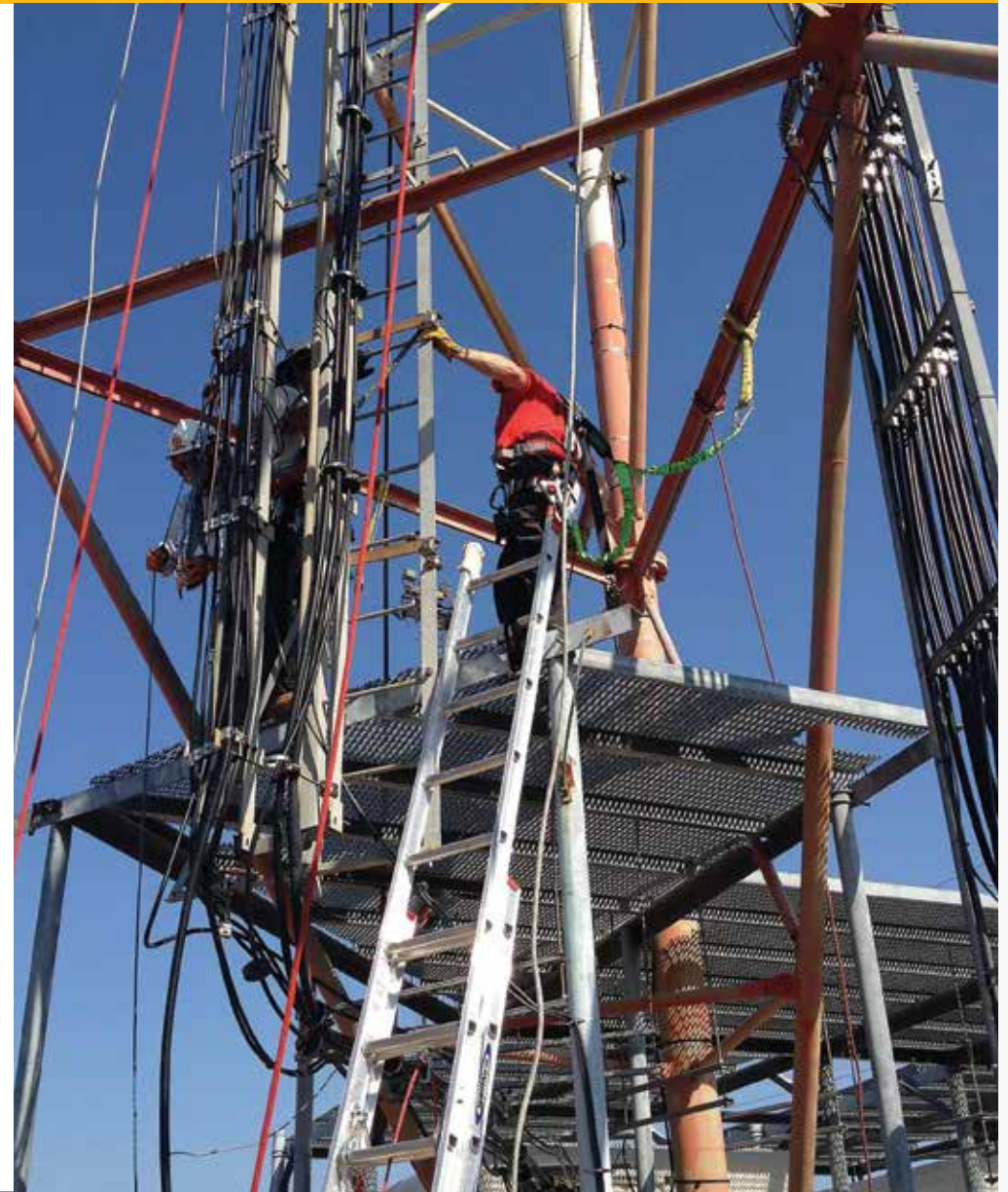
Safety Equipment for Towers

JOS is an emerging leader in providing Safety equipment for Overhead Transmission. It offers wide range of safety equipment and transmission towers fully compliant with international protection standards. The corner gates of towers are now normally supplied pre-wired. This ensures consistently neat wrapping and is the first step in accomplishing effective tower protection. The ACD's are normally supplied in tower sets of four corner gates with two opening and two non-opening with the Spacer Bars being ordered separately depending on numbers required per tower. JOS offers:

- Wood Pole Anti-climbing Devices (ACD's)
- 132kV Tower Anti-climbing Devices (ACD's)
- 275kV & 400kV NGC Tower
- Anti-climbing Devices (ACD's)
- Barbed Wire & Accessories

Apart from it, our supplied equipment for Anti-Climbing Devices include: Barbed Wire, Wire ties, Fasteners, Hook Bolts, Step Bolts. JOS also offer full range of **Notification Plates & Accessories** for wood pole and tower lines compliant with the latest Health and Safety requirements. They are supplied in permanent hard colors, either hard plastic or vitreous enamel on steel and in English and other languages to order. The various plate types come complete with mounting straps or bracketry and fasteners as necessary. Our provided notification plates includes but not limited to:

- Tower and Pole Number Plates,
- Circuit I.D. Plates,
- Danger of Death Plates,
- Phase Color Plates,
- Safe Climbing Height Plates.

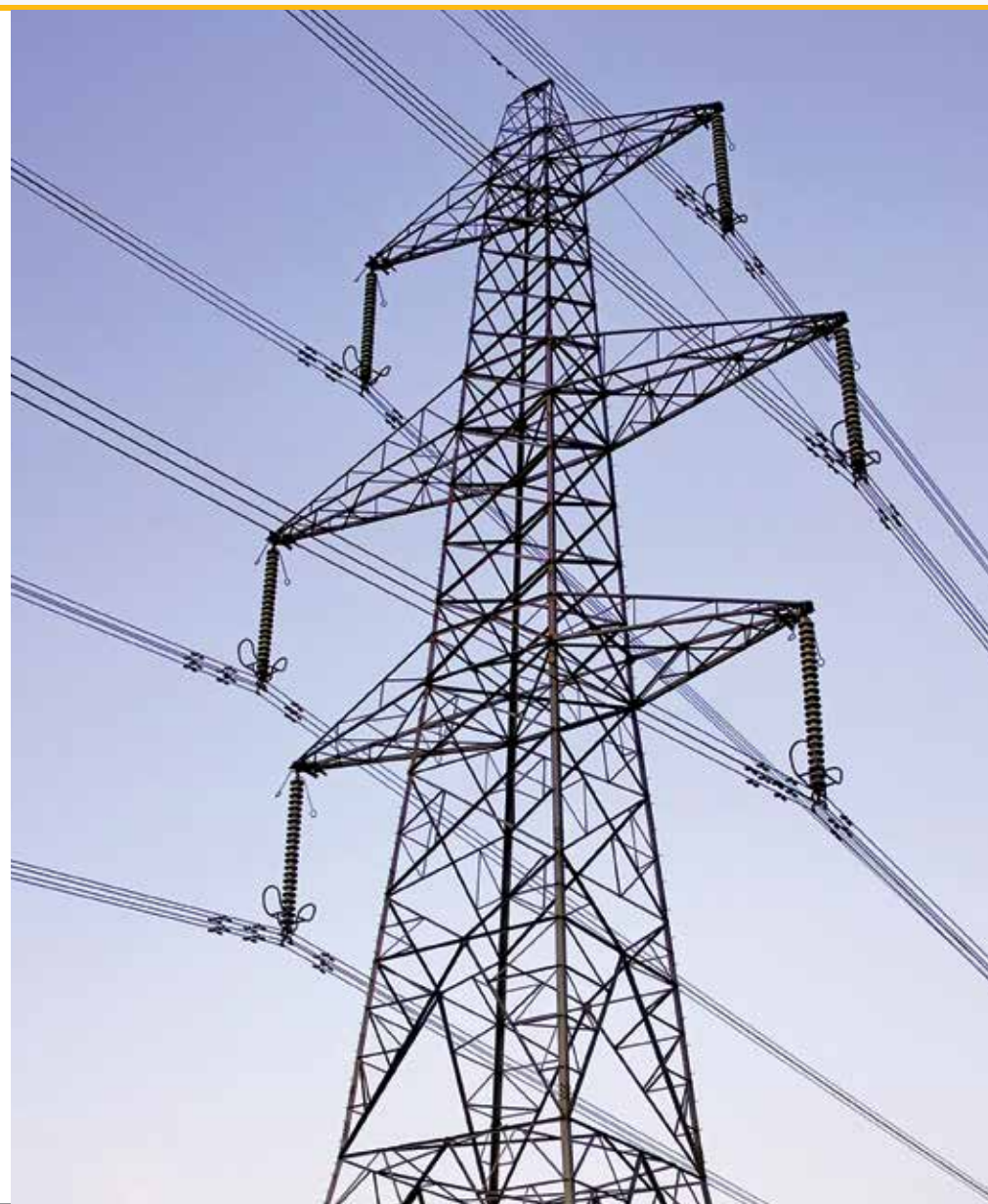


Procurement Services

Overhead Line Hardware

JOS provides a broad range of transmission line hardware that is used in generation of power, transmission and distribution. These imported products are fabricated using high quality raw material that is procured from reliable vendors. Our list of provided Overhead Line Hardware is as follow, but not limited to:

- A-frame cross arms
- Bolts & Nuts
- Channel / Angle iron cross arms
- Eyebolts
- Hip Stay assemblies
- LV Stay straps
- Pole Stubby
- Pole top brackets
- Spindles
- Stay baseplates
- Stay rods
- Strain cross arms
- Strut pole bracket
- Threaded rod
- Washers
- Wire thimbles





JOS offers **Street Lighting Solutions**
for growing Commercial & Industrial needs

JOS is your *reliable* partner...

It offers wide range of quality-oriented & performing outdoor luminaires for the sustainable well-being of urban or rural communities' varying technical needs.



Procurement Services

We offer LED Lighting Systems

Overview

JOS fully understands that outdoor lighting plays a crucial role in the safety and security of our streets and public places. Today outdoor lighting has to be smarter to comply with new legislation, environmental challenges and requirements to reduce energy usage.

This is where JOS distributes latest outdoor, roadway and street lighting imported solutions from leading manufactures in the industry to assure that its client's quality requirements can be meet satisfactorily. JOS has the ability to provide the most comprehensive product range available in the industry for following market segments:

1. Street Lighting
2. Decorative Post Top Lighting
3. Sign Lighting
4. Tunnel Lighting
5. Floodlighting

With its dedicated service, material control, quality assured processes and after sale services JOS is focused on developing long-term relations in the market with leading manufactures and its clients.



Street Lighting

JOS distributes Lighting System that is built on advanced LED optical designs that offer hundreds of photometric options to meet clients lighting requirments, while delivering reduced glare and improved light control.

Our distributed lighting systems provides improved uniformity, reduced glare and better lighting control without th eshadow circles commonly seen under LED post top fixtures. At JOS LED street lights are available in a variety of color temperatures with a wide beam spread.



Decorative Post Top Lighting

Our Lighting's range of decorative post top luminaries run the gamut from traditional to contemporary designs. Whether you choose a classic design or the trim styling of Contemporary models, you'll find that JOS's distributed decorative post tops provide superior photometric performance along with architectural appeal for your area lighting applications. JOS's ensures that its imported Decorative Lighting equipment provide improved uniformity, reduced glare and better lighting control without the shadow circles commonly seen under other LED post top fixtures.

Procurement Services

We offer LED Lighting Systems



Sign Lighting

With a great look, performance and durability, JOS's imported LED fixtures offer versatility while meeting your outdoor sign lighting requirements.

JOS offers numerous sizes, styles and finishes of sign lighting to showcase your office building or storefront for both aesthetic and security purposes. JOS works directly with many representatives of manufacturing companies to recommend the proper fixtures for each environment. With many options and brands available to us, you can rest assured that we will provide the products that best suit your needs.



Tunnel Lighting

JOS's imported Tunnel LED fixtures help in creating a safe environment for traffic with white light for improved visibility and comfort while providing advanced lighting control to optimize distribution and meet photometric requirements of the client's growing needs. Our equipment is highly durable and reliable for long lifetime, with an easy and rapid tool-less maintenance solution to speed up installation and reduce maintenance costs. These Tunnel LED fixtures are available in a range of optical combinations for flexibility across a wide range of applications such as low and high speed tunnels, underpasses and industrial areas.



Flood Lighting

JOS imports reliable LED fixtures for flood lighting that offer long-life, durable construction to meet a variety of exterior lighting applications. JOS's distributed Flood Lighting is the premium outdoor lighting solution for professional arena applications. Our imported floodlights are designed for parking lot lighting, building and grounds lighting, facade lighting, industrial yard lighting, recreational area lighting, and other general purpose area lighting applications. With a great look, performance and durability, these fixtures offer versatility while meeting your outdoor lighting requirements.



05 - OIL & GAS MATERIALS SUPPLY

COMPARISON BETWEEN LED STREET LIGHT AND CONVENTIONAL STREET LIGHT

#		Replace 1000W HPSL		Replace 400W HPSL		Replace 250W HPSL	
		Philips SON-T Series	LED Light	Philips SON-T Series	LED Light	Philips SON-T Series	LED Light
1	Nominal Power	1000W	400W	400W	150W	250W	100W
2	Actual Power	1080W	400W	450W	150W	280W	100W
3	Luminous Efficacy of Light Source	120lm/W	150lm/W	112lm/W	150lm/W	108lm/W	150lm/W
4	Valid Luminous Flux of the whole light	45000lm	44000lm	16000lm	16500lm	11500lm	11000lm
5	Color Rendering Index	Ra23	Ra70	Ra23	Ra70	Ra23	Ra70
6	Power Factor (PF)	0.8	0.95	0.8	0.95	0.8	0.95
7	Interval Time for Routine Maintenance	1 Year	3-5 Year	1 Year	3-5 Year	1 Year	3-5 Year
8	Color Temperature (CCT)	2000K	3000-6500K	2000K	3000-6500K	2000K	3000-6500K
9	Lighting Time per Day	10H	10H	10H	10H	10H	10H
10	Power Consumption per Day	10.8KWH	4KWH	4.5KWH	1.5KWH	2.8KWH	1.0KWH
11	Power Consumption per Month	324KWH	120KWH	135KWH	45KWH	84KWH	30KWH
12	Power Consumption per Year	3942KWH	1460KWH	1642.5KWH	547.5KWH	1022KWH	365KWH
13	Electric Quantity Saving per Year for One Set		2448KWH		1095KWH		657KWH
14	Energy-saving Ratio		62.90%		66.70%		64.30%
15	Energy-saving Ratio when Using Night Intelligent Controlling Technology		72.20%		75.00%		73.20%

Note: HPSL stands for High Pressure Sodium Lamp



05 - OIL & GAS MATERIALS SUPPLY

COMPARISON BETWEEN LED STREET LIGHT AND CONVENTIONAL STREET LIGHT

#		Replace 150W HPSL		Replace 100W HPSL		Replace 70W HPSL	
		Philips SON-T Series	LED Light	Philips SON-T Series	LED Light	Philips SON-T Series	LED Light
1	Nominal Power	150W	60W	100W	40W	70W	25W
2	Actual Power	180W	60W	130W	40W	90W	25W
3	Luminous Efficacy of Light Source	97lm/W	150lm/W	90lm/W	150lm/W	80lm/W	150lm/W
4	Valid Luminous Flux of the whole light	6500lm	6600lm	4400lm	4400lm	2700lm	2740lm
5	Color Rendering Index	Ra23	Ra70	Ra23	Ra70	Ra23	Ra70
6	Power Factor (PF)	0.8	0.95	0.8	0.95	0.8	0.95
7	Interval Time for Routine Maintenance	1 Year	3-5 Year	1 Year	3-5 Year	1 Year	3-5 Year
8	Color Temperature (CCT)	2000K	3000-6500K	2000K	3000-6500K	2000K	3000-6500K
9	Lighting Time per Day	10H	10H	10H	10H	10H	10H
10	Power Consumption per Day	1.8KWH	0.6KWH	1.3KWH	0.4KWH	0.9KWH	0.25KWH
11	Power Consumption per Month	54KWH	18KWH	39KWH	12KWH	27KWH	7.5KWH
12	Power Consumption per Year	657KWH	219KWH	474.5KWH	146KWH	328.5KWH	91.25KWH
13	Electric Quantity Saving per Year for One Set		438KWH		328.5KWH		237.25KWH
14	Energy-saving Ratio		66.70%		69.20%		72.20%
15	Energy-saving Ratio when Using Night Intelligent Controlling Technology		75.00%		76.90%		79.20%

Note: HPSL stands for High Pressure Sodium Lamp



Procurement Services

Avenue Poles for Streetlights

JOS provides Street Lighting poles for category Pedestrian (P) & Vehicular (V) lighting requirements. The Avenue range of poles is predominantly designed for Category P (pedestrian) and is ideally suited for use in residential subdivisions, commercial developments, recreational pathways, and parks.

Options and Accessories

- Avenue Street Lighting poles are base plate mounted as standard, but can be designed for in-ground mounting
- The poles are hot dip galvanized and can be powder coated or painted in the colour of your choice
- The range is available in tapered octagonal and tapered round
- Standard mounting heights are 5.5m to 12m
- Standard outreach lengths are 1.5m to 3m
- Poles can be provided for differing heights and outreach lengths
- Avenue poles are also available in a hinged seesaw configuration



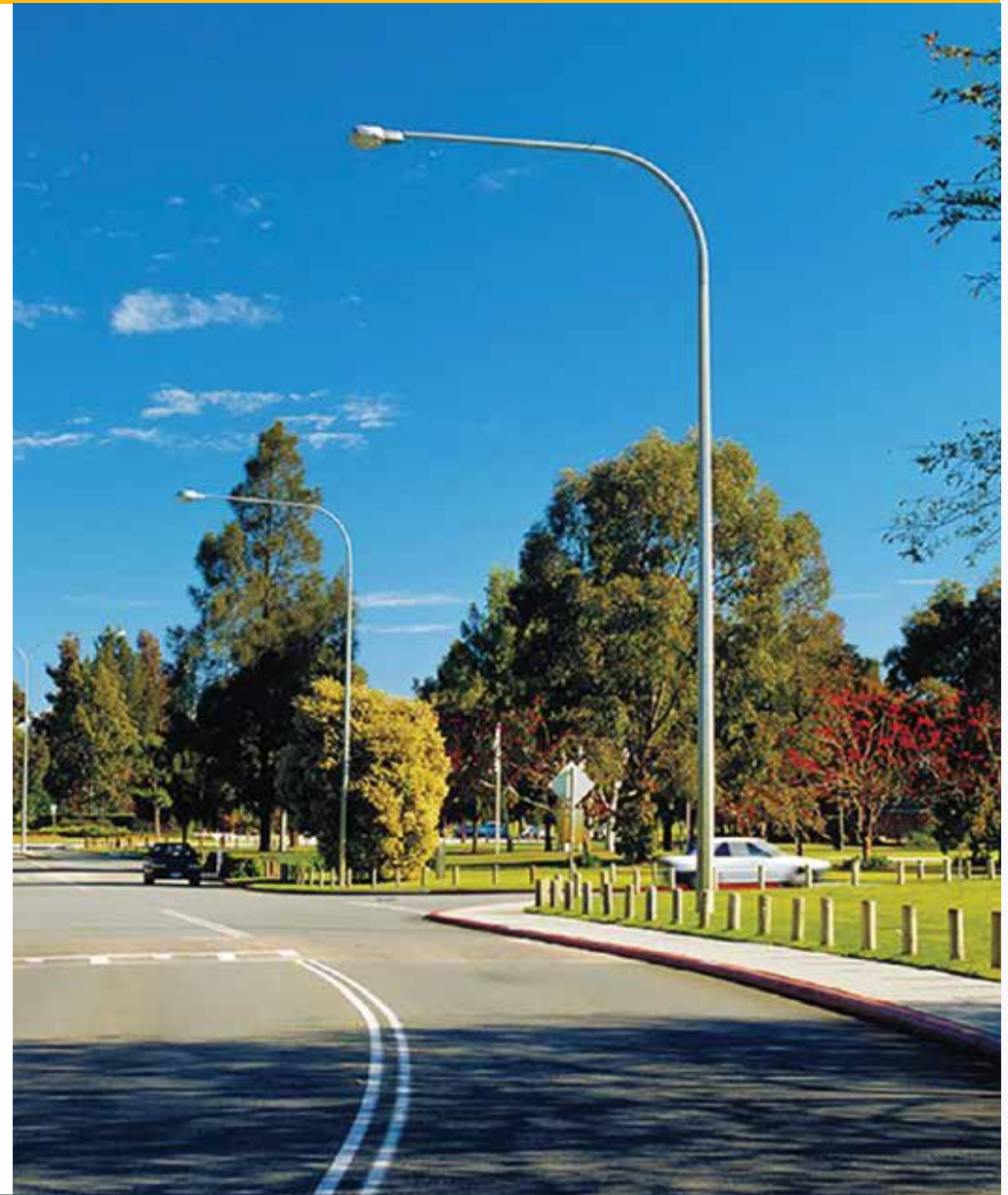
Procurement Services

Freeway Poles for Streetlights

The Freeway Street Lighting range was inspired by the need for greater outreaches over wide roadways. The predominantly Category V (vehicular) designed poles are ideally suited for multi-laned roads. The range is an extension of the tapered octagonal Avenue range of poles, but utilises a heavy-duty shaft allowing for outreaches of up to 4.5m in length.

Options and Accessories

- The Freeway Street Light range is base plate mounted as standard, but can be designed for in-ground mounting
- The poles are hot dip galvanized and can be powder coated or painted in the colour of your choice
- The range is available in tapered octagonal
- Standard mounting heights are 10.5m to 12m
- Standard outreach lengths are 1.5m to 4.5m
- Poles can be provided for differing heights and outreach lengths



Procurement Services

Impact Absorbing Poles for Streetlights

An impact absorbing pole looks similar to a normal rigid pole, but features innovative vertical slots at the base to create a cushioning effect if the pole is hit by a vehicle.

Advanced high strength steel is used to make the new pole absorb the energy of an impact and bend over the colliding car. Under design criteria and circumstances, the poles will stop a vehicle and minimise the force on the vehicle's occupants. The pole remains attached to the base structure and absorbs impact energy progressively, entrapping the impacting vehicle as the pole deforms. In this way the number of fatal accidents can be strongly reduced.

Options and Accessories

- Impact Absorbing poles can be either base plate or in-ground mounted
- The poles are hot dip galvanized and can be powder coated or painted in the colour of your choice
- Available in tapered round and tapered octagonal
- Varying heights and outreach lengths can be provided for client's requirements



Procurement Services

Slip Base Poles for Streetlights

The revolutionary engineering design of Slip Base poles enables the pole to slip at the base and fall should a collision occurs. This ideally suits freeways and other high-speed roadways where the likelihood of a secondary accident, resulting from the falling pole, is accepted as being unlikely.

Options and Accessories

- Slip Base Poles are base plate mounted, either on an in-ground section or concrete foundation
- The poles are hot dip galvanized and can be powder coated or painted in the colour of your choice
- Slip Base poles are available in tapered round and tapered octagonal
- Varying heights and outreach lengths can be provided for client's requirements



Procurement Services

Court *Poles for Floodlights*

The Court range is commonly used for lighting tennis and basketball courts, schools, and carparks. The design of the square parallel tube pole caters for applications where, architecturally, a square profile is preferred to suit the mounting of rectangular luminaires, such as the shoebox type lighting fixture.

Options and Accessories

- Court poles are base plate mounted as standard, but can be designed for in-ground mounting
- The poles are hot dip galvanized and can be powder coated or painted in the colour of your choice
- The range is available in square hollow section (SHS)
- Standard mounting heights are 4m to 10m
- Poles can be designed for different heights
- Luminaire adaptors are provided with pole



Procurement Services

Mall Poles for Floodlights

The simple design component of the Mall range is ideal for carpark, mall, and pathway floodlighting. Mall poles are of a circular parallel pipe construction and are best suited for post top luminaires.

Options and Accessories

- Mall poles are base plate mounted as standard, but can be designed for in-ground mounting
- The poles are hot dip galvanized and can be powder coated or painted in the colour of your choice
- The range is available in circular hollow section (CHS)
- Standard mounting heights are 3m to 6.5m
- Luminaire adaptors are provided with pole



Procurement Services

Boulevard *Poles for Floodlights*

The Boulevard range of Floodlighting Poles are the most flexible in terms of design. Ideally suited for medium sized floodlighting requirements such as commercial developments and recreational area applications, the range is available in tapered octagonal and tapered round poles. The range has been designed to allow for greater luminaire control gear space in the base of the pole, in order to accommodate multiple lighting fixtures.

Options and Accessories

- Boulevard poles are base plate mounted as standard, but can be designed for in-ground mounting
- The poles are hot dip galvanized and can be powder coated or painted in the colour of your choice
- Poles can be provided for different heights
- Tapered octagonal Boulevard Poles are available in a Hinged Seesaw configuration.



Procurement Services

Park Poles for Floodlights

The Park range is suitable for large commercial applications such as floodlighting for sporting ovals and golf driving ranges. The design of this range allows for multiple lighting fixtures to be accommodated.

Options and Accessories

- Park poles are base plate mounted as standard, but can be designed for in-ground mounting
- The poles are hot dip galvanized and can be powder coated or painted in the colour of your choice
- The poles are available in tapered round and tapered octagonal
- Standard mounting heights are 3m to 20m in tapered round and 8m to 30m in tapered octagonal
- Poles can be provided for different heights
- Tapered octagonal Park Poles are available in a Seesaw configuration
- Climbing rungs can be attached to the pole commencing at 6m
- Includes Lamping platform and additional access doors
- Includes Luminaire Adaptors, Cross Arms, Headframes and Lightning Protection Rods



JOS OFFERS WIDE RANGE OF OVERHEAD LINE HARDWARE



Procurement Services

Track Poles for Floodlights

The Track range is most suited for stadium floodlighting where optimum lighting specifications need to be achieved. Designed with 16 sides for greater strength, the poles in this range can accommodate larger than normal sail areas to attain your lighting requirements.

Options and Accessories

- Track poles are base plate mounted as standard, but can be designed for in-ground mounting
- The poles are hot dip galvanized and can be powder coated or painted in the colour of your choice
- The poles are available in tapered 16 sided
- Standard mounting heights are 6m to 30m
- Poles can be provided for different heights
- Climbing rungs can be attached to the pole commencing at 6m
- Includes Lamping platform and additional access doors
- Includes Luminaire Adaptors, Cross Arms, Headframes, and Lightning Protection Rods





Manpower Supply



Jabel Oil Services offers manpower supply services of talented and highly experienced workforce from overseas

06 - MANPOWER SUPPLY

Our vision

JOS's Manpower Supply Unit's vision is to become regional leader in providing contingent and permanent recruitment workforce solutions to the Oil & Gas Industries.

Our Mission

JOS's Manpower Supply Unit's mission is to lead in the creation and delivery of highly talented, experienced and innovative workforce solutions or services in the Oil & Gas Industries that enable its clients to succeed in the changing competitive world.

Our Objectives

To properly execute its strategic mission and achieve desired strategic vision JOS's Manpower Supply Unit's plans to adhere its core activities to following carefully crafted objectives:

- Develop and reinforce the need for competitive compensation to attract and retain top talent for the Oil & Gas Industries.
- Research for growing demand in Oil & Gas industries for specific workforce skills and invest in professional development programs designed to improve job skills, leadership capabilities and employee productivity.
- Educate employees about the importance of self-awareness; self-care and behavioral change in improving wellness and productivity to enable organizations achieve operational excellence in the industry.

Our Values

- People
- Knowledge
- Innovation



06 - MANPOWER SUPPLY

JOS provides manpower supply services from overseas such as Europe, USA and Canada of highly trained and professional workforce such as Professional Staff/Consultant, Supervisors, Engineers, Drilling Specialist, HSE, Technicians and Highly Skilled workers to ensure that clients performance in every project is in accordance with the International Standards and Practices.

Our Manpower is well selected from around the world and supplied according to job description requirements with high standards complying with the Oil and Gas industries levels. Following is a list of wide range of Specialized Categories from which offers its Manpower Supply Services:

A/C Technician	Civil Engineer	Fire Engineer	Land Surveyor	Safety Engineer
Accountant	Civil Inspector	Fire Safety Specialist	Lineman	Safety Officer
Administration Staff	CNC Operator	Fireman	Material Controller	Safety Specialist
Assistant Camp Boss	Comm. Technician	Foreman Lineman	Material Specialist	Skilled Labor
Auto Denter	Comm. Tower Rigger	Foreman Welder	Mechanical Engineer	Sr. Civil Inspector
Auto Electrician	Corrosion Engineer	Gas Mechanic	Mechanical Specialist	Sr. Diesel Mechanic
Backhoe Operator	Crane Operator	H.E. Mechanic	Painter	Sr. Environmental Advisor
Boom truck Operator	Diesel Mechanic	Head of Travel Department	Photocopy Technician	Sr. Instrument Technician
Bus Driver	Document Controller	HSE Drilling Advisor	Pipe fitter	Storekeeper
Cable shop Electrician	Driver	HSE Specialist	Piping Engineer	Tank & Vessel Inspector
Cable Splicer	Electrical Engineer	HSEMS Advisor	Piping Supervisor	Timesheet Coordinator
Camp boss	Electrical Technician	HSEMS Coordinator	Plumber	Training coordinator
Camp maintenance	Environmental specialist	Instrument Inspector	Project Engineer	Welders Plate and Pipe
Car Painter	Fire Alarm Technician	Instrument Technician	Purchaser	Welding Foreman
Carpenter	Fire Commander	Laborer	Rotating Mechanic	Welding Technician





Catering, Laundry
& Housekeeping
Services

07 - CATERING, LAUNDRY & HOUSEKEEPING SERVICES

We strictly implement policies to maintain our workforce healthy



We can provide to our client the best services for Catering (Food & Housekeeping) as follow:

- Purchase of all food and cleaning material.
- Deliveries of food items and cleaning items to the camp by refrigerated truck.
- Preparation of 3 meals per day (breakfast, lunch and dinner) .
- Cleaning kitchens and dining rooms after every service.
- Keep stores freezers and chillers clean at all time.

Provide laundry service as follows :

- Wash and press personal and working clothes twice per week.
- Wash be sheets, pillow cases and towels twice per week.

Provide house keeping services as follows :

- Clean bedrooms and make beds once per day.
- Change and wash sheets pillow cases and towels twice per week or at every change of resident
- Clean accommodation once per day.
- Provision of one soap bar and small box of soap powder every week.
- Clean blocks three times per day.
- Collection of light garbage around the building daily.
- Recruit catering personnel, pay wages, leave salaries, visas, food...etc...
- Provision of professional catering uniforms.





Our Policies



JOS has established wide range of policies and procedures to minimize industrial hazards while protecting lives of JOS's workforce and citizen.



*Life is too important to be **taken seriously**.
That's why we put **Safety First!***



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01 - ACIDIZING

Application

- The pumping of any type of acid at all operated concessions and field locations.

Potential Hazards

- Pressure
- Toxic Fluids
- Static Electricity
- Pressure Testing

Procedure

Acid zing operations are site specific, make sure you have standard operating procedure (SOP) for each operation

Equipment spacing

- Be aware of prevailing wind direction, keep people and equipment up wind if possible
- Have at least 2 separate escape routes identified and marked
- What's above you? Any power lines for example?
- Fire protection equipment
- May need a fire truck* in attendance if pumping flammable / energized fluids
- Have at least one continuous foam unit in attendance
- Are fire hoses clean?
- Is fluid flow acceptable?
- Minimum two hoses deployed on hand.
- Fire extinguishers deployed around the site, can everyone use them.
- Are they the right type?

Note: It can also be used in emergency if someone gets splashed with chemical, use to wash down

General PPE, Chemical Mixing/Handling

- Everyone charged with mixing/transfer of chemicals must wear rubber boots, aprons and gloves that are impervious(to prevent) to the chemical being handled
- Carry out a chemical PPE assessment to determine the actual PPE to be worn and to identify any specific hazards of the job
- Damaged/punctured PPE must be discarded (not to be used)
- Anyone exposed to vapors must wear full face respirators with appropriate cartridges (i.e. rated for the specific chemical in use)
- At least two eyewash stations must be available on site and at least one shower, make sure they have all been function tested and that the water quality is acceptable
- Anyone exposed to the acid blend fluids during mixing/pumping must immediately remove PPE and clothing and then have a shower
- All contaminated clothing must be discarded
- Acid additives preferably bind (combined)to protein (i.e. skin, hair, leather etc) so when the work is completed PPE must be rinsed off and the individuals take a shower
- Cordon off the area, erect warning signs banning unauthorized entry
- There shall be no eating, drinking or smoking on/at the work site by anyone. Remove PPE and wash thoroughly before eating drinking or smoking

References:

- API Recommended Practice (RP) 54
- HSE Standards Manual
- Hydrogen Sulfide Safety – H 006
- Personal Protective Equipment – P 002
- Electricity – E 002
- Pressure Testing – P 008



02 - ASBESTOS

Purpose

- To communicate procedure associated with Asbestos Containing Material (ACM)

Definition

- Any material containing over 1% asbestos estimated by volume is defined as Asbestos Containing Material (ACM)

Potential Hazards

- Asbestos fibers, if advertently inhaled, can contribute to the development of associated lung diseases such as cancer and mesothelioma.
- Procedure
- Prior to work being performed each worksite where ACM is present should develop a site specific asbestos handling procedure.
- Insulation containing material not clearly identified as asbestos free (or equivalent wording) should either be treated as ACM or analyzed phase contrast microscopy to determine if asbestos is present in the material.

Responsibility

- It is a responsibility of every supervisor to ensure protection steps against the potential hazards above are implemented and carried out

Control of Asbestos

- Worksite must be kept clean and free of asbestos dust accumulation; it is prohibited to clean asbestos dust using compressed air stream. Personnel who carry out cleaning operations must wear appropriate PPE and respirator

Asbestos Precaution

- Bags used as asbestos containers mustn't be penetrable by asbestos fiber
- Asbestos or asbestos waste except asbestos cement or its engaged material cannot be stored, distributed, or delivered without closed container
- All containers containing asbestos or asbestos waste must have a sign: "Asbestos Containing Material do not Inhale" except asbestos cement

products and asbestos which engaged by other material

- Bags of asbestos must be disposed in a way so that it cannot be re-used
- Asbestos waste must be disposed by dispersing evenly in the pit then filled out with soil at least 25 cm thick; or other approved practice.

References

- General industry standard 29 CFR – OSHA 1910.1001 asbestos.
- Construction standard 29 CFR – OSHA 1926. 1101 asbestos.
- 29CFR – OSHA 1910. 132 – Personal protective equipment.
- 29CFR – OSHA 1910. 134 – Respiratory protection.
- 40 CFR – NESHAPS delegations 40 CFR 61.
- Department of transportation-hazardous materials DOT 49 CFR 171-173



03 - CATERING

Purpose

- To prevent injury or illness caused by catering activities throughout the operations.
- As standard procedures to handle food safely, healthy, environmental friendly, and efficiently.
- To contribute an enjoyable dining experience.

Application

- Standards Manual applies to all personnel in

Definitions

- Defrost: Make or become free of frost or ice
- Reheating: To heat a food again so it will ready to serve.
- Toast: To heat and brown (bread, for example) by placing in a toaster or an oven or close to a fire.
- The Danger Zone: Condition in temperature between 4.5o to 60o C when bacteria grow most rapidly, doubling in number in as little as 20 minutes.
- Pest: An annoying animal.
- Insecticides: A chemical substance used to kill insects.
- Rodenticides: A chemical substance used to kill rodents.
- Liquors: Alcoholic beverage.
- Freeze : The withdrawal of heat to change something from a liquid to a solid -18o to -5o C
- Chill: A moderate but penetrating coldness 1o to 4o C.
- Moldy: Contains any of various fungi that often cause disintegration of organic matter.
- Refrigerator: An appliance, cabinet, or room for storing food or other substances at a low temperature.
- Meat: The edible flesh of animals, especially that of mammals as opposed to that of fish or poultry
- Poultry: Flesh of chickens or turkeys or ducks or geese rose for food.
- Marinade: To soak meat, fowl, fish, or vegetables in a liquid mixture, usually

of vinegar or wine and oil with various spices and herbs, before cooking.

- Brining: To immerse, preserve, or pickle in salt water.
- Leftover: Food remaining from a previous meal.
- Disposal: The act or process of getting rid of something.
- Influenza symptoms: experience of chills; fever (above 38C); muscle pain, sneezing, headache, soar throat, dry and hacking cough, chest pain.

General

- Roles and Responsibilities: The roles and responsibilities for ensuring high standards of safety, health and hygiene, at field catering facilities rest with the contractor-catering supervisor at the work site. However, the accountability lies with the Area Superintendent
- Safety and Health Hazard: Safety and Health hazards, which are common to all these facilities, regardless of type, are caused by: harmful bacteria (protozoa), virus, chemical, pesticide, metal (lead, copper), poisonous plant, fires, disease, animals (e.g.: rats, cats, dogs, insects, worms), sharp objects. Avoid The Danger Zone, between 4.5o - 60o C.
- Catering Personnel Hygiene: All catering personnel required to handle or prepare food shall be screened at recruitment regarding their past history and periodical return from day-off of any illnesses e.g.: typhoid, paratyphoid, diarrhea, dysentery, tuberculosis, hepatitis, skin diseases, and influenza symptoms. Catering personnel must report any illness to the Doctor on duty if he/she suffering from those diseases. Personnel with cut and/or long fingernails shall not be allowed to handle food.
- Pest Control: All food must be protected from contamination by birds, insects, rodents, or other pets. Insecticides and rodenticides in required area must only be carried out by trained pest control personnel.
- Cleaning of Facility: Kitchen and dining structural, and equipment surfaces must be constructed of washable materials (smooth impervious and easy to clean), which can be effectively cleaned from germs. No dusting or sweeping activities shall be carried out during food preparation and serving. Cleaning must be conducted in conjunction with handling instruction of cleansing agent provided by the manufacturer.



03 - CATERING

- Prohibited Items: The following items are prohibited to serve in operation: fresh crabs, fresh shells, fresh oysters, and liquors.

Supply & Receiving Material

- Foodstuff must be delivered to receiving point in good quality. Food temperature, conditions and date code must be checked on the receipt of goods. Store Keeper is responsible for ensuring the quality of foodstuff upon receipt.
- Discarded any meat or poultry that have off odor, sticky or tacky to the touch, or slimy.
- Each meat and poultry must be delivered separately in a single plastic wrap.
- Corroded, punctured, bulging, lead soldered and dent canned and expired foodstuffs are not accepted.
- Foodstuff shall be delivered in the mode of freeze (meat, fish), dry (soft drink, rice, sugar, flour, noodles, etc.) and chill (vegetables, fruit, fresh milk, eggs) as per requirement. Do not freeze canned food or eggs in shell.
- Transportation containers to deliver foodstuff shall be in good shape and condition (appropriate temperature, no dent, no corrosion).
- Re-usable plastic baskets shall be used to deliver vegetables, fruits and eggs. No wooden boxes are acceptable. Re-use of carton boxes ex cleaning agents or lube oil for packing food is prohibited.
- Eggs shall be washed thoroughly in 50 – 55 o C. prior to storing. Cracked egg shall be discarded.

Storage

- Storage must facilitate rotation of stock; the FIFO (First In First Out) principle must be followed at all time.
- Food stock shall be separately stored from all other items (linen, disposable, cleaning material, stationery, pesticide, etc.). COSHH STORE
- All raw food shall be separately stored from cooked and prepared food.
- Keep all meat and poultry in its package until using. Discard any foods that have been contaminated by raw meat juices.

- Keep food containers off the floor. (use Pallets)
- Storage of dried and canned food must be dry, cool and well-lit, well-ventilated, pests proof, and kept clean and tidy. Deep freezers must only be used for frozen product. The freezer shall run at minus 18 deg Celsius, while chiller shall run at 4 deg Celsius. Freezer and chiller temperature must be monitored and recorded daily by Store Keeper. Avoid overfill of refrigerator, and never leave perishable goods out of the refrigerator over two hours.
- Storage must be free of pest, contamination and corrosion.
- All doors opening to the exterior of the chiller and/or refrigerator shall be flush fitting to prevent entry of pests.
- Inside door opening must be fitted in all Walk-in Freezer and chiller.
- All moldy food shall be immediately discarded from storage. Don't sniff on them.

Food Preparation

- Personnel Hygiene
- Bad habits such nose/ear picking, spitting, nail biting, finger licking, chatting, eating or drinking must be avoided at all time during food preparation and service areas.
- Always wash hands with warm soapy water before and after preparing food for at least 30 second.
- Use disposable tissue if coughing and sneezing, and always wash hands after coughing and sneezing into them.
- Protective clothing (uniform and apron), glove, and cap must be worn and maintained in a clean condition.
- Never touch food with bare hands, use disposable plastic gloves/utensils.
- No Smoking

Food

- Thawing of frozen meat, poultry and fish slowly in the refrigerator for meat preparation instead of preheating or reheating. Never thaw at room temperature (22oC) neither use hot water.



03 - CATERING

- Always marinate or brining food in the refrigerator, not in the counter. Never use leftover marinates or brine.
 - Meat, poultry, and fish must always be separated from sauce or stocks during cooling and refrigeration.
 - Don't keep eggs out of refrigerator more than 2 hours.
 - Raw eggs dishes, cold dessert, and cold sauces made with raw eggs are forbidden.
 - Fresh vegetables and salad items must be thoroughly washed in cold water containing chlorine salad wash, according to manufacturers recommended dilution and left for 15 minutes. Inspect all items for traces of insects, caterpillars, slugs, or other foreign material. Cut away any damage or bruised area. Immediately refrigerate any fresh-cut items such as salad or fruit.
 - Use up milk, canned fruit/vegetables/juices, once the container is open.
 - Once the can is opened move the content to a clean container and refrigerate them promptly. Remove can lid completely. Do not put any kitchen utensils into the container.
 - Reheating of leftover food is not acceptable.
 - Clean all foods thoroughly.
- preparation bench, between jobs on the same bench, at the end of the day, first thing in the next morning.
- Use disposable paper towels for wiping, eliminating tea towels and similar fabrics.
 - Can openers must be kept clean and sterilized at least once per day.
 - Blades must be sharp free from damage, renewed as necessary & kept clean.
 - Food cans/containers must be washed thoroughly prior to opening.
 - Defect kitchen utensils shall not be used.
 - All kitchen utensils must be maintained and cleaned.
 - Use a wooden tamper when operating food choppers and meat grinders.
 - Cook red meat and eggs to 70o C, poultry 80o C, use a food thermometer to make sure the food has reached a safe internal temperature. Make sure to check temperature in the wing joint for poultry. To check visually, red meat is done when it is brown or grey inside, poultry juices run clear.
 - Cooking shall not be interrupted. Never refrigerate partially cooked product to later finish cooking on the grill or in the oven.
 - Bring sauces, soups, and gravy to boil.
 - Never taste

Equipment

- Use plastic cutting board instead of wooden cutting board.
- Use different cutting board and knife for meat, fish, vegetables, fruit, bread/ cake and chili.
- Clean all kitchen equipment including the cutting board and any utensils before and after preparing food. Use hot soapy water.
- Disinfect cutting boards using a solution of 2 tsp of household bleach in 1 liter of hot water. Wash the board thoroughly after disinfecting.
- Replace cutting board periodically
- Don't use the same platter and utensils for raw and cooked meat or poultry.
- Use only electrical range stove that can reach more than 163o C.
- Use a fresh solution of detergent/sanitizer before starting work on a

Food Serving

- Wash hands with soap and warm water before serving food.
- Serve cooked products on clean plates with clean utensils.
- Defective drinking or eating utensils must be discarded immediately.
- Hot food shall be kept above 60o C until served.
- Cold dish temperature must be below 5o C.
- No superfluous decoration of food serving shall be used.
- Do not share food, cups, straws and hand towels.
- Do not put your forks, spoons, into communal dishes.



03 - CATERING

Leftover & Disposal

- Wash hands with warm and soapy water before and after handling leftovers.
- Discard any food left out at room temperature (22o C) for more than 2 hour, 1 hour if the room temperature more than 32o C.
- Clean and dirty items shall be handled separately.
- Wash cycle temperature for washing machine is 49 – 60o C. The rinse cycle temperature is 66 - 82o C.
- Never use wire wool to wash metal pot sauce
- Use separate basins for washing and rinsing.
- All kitchen garbage must be placed in covered containers, which have either plastic bin liners or plastic bags inside them.
- Garbage shall be buried without the plastic bags in a prepared trench and covered with at least 50 yards from the kitchen and eating area.
- Bio-degradable bags, incinerator

Note: Food Poisoning occurs 4-12 hours after ingestion (after the meal is served) The Area Superintendent shall obtain medical guidance to overcome the issue.

References

- Consumer Education and Information from US Department of Agriculture (USDA).
- OSHA Standard No. 1910.1200
- COSH (Control of Substances Hazardous to Health)

Training

- Area Superintendent is responsible to ensure that all catering staffs are trained.
- In accordance with HSE STANDARDS MANUAL Section T003.

Audit

- Mechanism of catering audit/inspections conducted by consists of Self (semiannually),
- Weekly and impromptu. In addition to these inspections, the contractor management is required to conduct self-inspection between Self audits.

Food Posining Outbreak

Complain on foreign body/unfit food shall be investigated and necessary action shall be taken. Food poisoning outbreak shall be investigated and the following action shall be taken:

- Stop serving the suspected food
- Isolate and take sample of the suspected food to the laboratory test



04 - CHEMICAL HANDLING, USAGE AND LABELING

Potential Hazards

- Hazardous Chemicals
- Static Electricity
- Combustible/Toxic Fluid
- Corrosive
- Human affects
- personal injury
- Heat

Procedures

Master Chemical Inventory List

- Each site will conduct an inventory of chemicals that are under their control. The inventory will be conducted annually or when new sites become operational.
- The master chemical list will be updated to include any new chemicals or in response to product name changes.
- Unknown chemicals or chemicals not on the master list shall not be released until a Material Safety Data Sheet (MSDS) can be obtained and reviewed. After reviewing the MSDS and training employees, the chemical may be released.
- Chemicals that are no longer in use should be removed from the master list but retained until all of the chemical has been removed from the site

Material Safety Data Sheet

- An MSDS is the basic reference source of safety and health information for chemicals in the workplace (OSHA 1910.1200). An MSDS for each chemical used in the workplace must be available to all employees and can be obtained from the chemical manufacturer.

Each MSDS Must Contain the following:

- Identity used on the label, including chemical and common names of material and ingredients, if a mixture.

- Physical and chemical characteristics
- Physical hazards (of the hazardous chemical), including any potential for fire, explosion, and reactivity.

Health hazards, including:

- Signs/symptoms of exposure
- Permissible exposure limits
- Primary routes of entry
- Identity as a carcinogen, if applicable

General applicable control measures:

- Precautions for safe handling and use
- Emergency and first aid procedures
- Date of MSDS preparation or update
- Contact information for MSDS preparer who can provide additional info

Labeling

- Labels must include the name of the hazardous material, appropriate warnings, managing used, surplus, out-of-date chemicals, chemical storage, the name and address of the manufacturer. The Supervisor is responsible for confirming ensuring that employees attach and maintain the appropriate label (s).

Reference:

- MSDS must be accompany chemical /substances when transferred to field operations
- Every drum/bag/sack/bucket should have the following information stenciled (paper labels only are not acceptable) on its side: gross/net weight, product name, manufacturer's name, chemical type (antifoam, scale inhibitor, etc.), manufacturer's batch or quality control number, warning labels (paper label acceptable either on the drum or on a placard for palletted bags/sacks/buckets to indicate material as corrosive, flammable,



04 - CHEMICAL HANDLING, USAGE AND LABELING

etc.). For drums, the product name must also be stenciled on the top of the drum. A complete each pallet of drums/bags/sacks/bucket.

- Bulk containers (stainless steel, Shutz-type, Tote, etc.) must contain the aforementioned information on a placard attached to the tank body. All valves must be protected from accidental rupture/damage, e.g. valve is inset with respect to the bulk tank body.
- Additional signage for areas or tanks devoted to chemicals with like hazards may be required (e.g. flammable, caustic, poison signs). Site Managers and Supervisors shall check with their Safety Supervisor.

The following labeling system will be used if the manufacturer's label is insufficient:

- Attachment of label will be done by the employee or Supervisor at the time of receiving material. The label will include:
- Name of the product/chemical
- Appropriate hazard warnings (this will denote as a minimum, the health, reactivity and fire hazards).
- List of required protective equipment for employees working with the material.
- When transferring a hazardous material from one container into another, the employee performing the transfer must apply a label on the new container noting the information from the original container. The employee performing the transfer is responsible for correctly completing and applying the label.
- Contractors are responsible for assuring that all of their containers of materials are labeled properly. Contractors are informed about the provisions of this chemical handling program during pre-job contractor safety orientation meetings.

Labeling Expectations

- A hazardous chemical that was transferred from a labeled container into a portable container and which is intended for immediate use by the

employee who performs the transfer. The container must be under the employees control and used immediately.

- Containers that already have a label with the required information.
- Any consumer product or substance when used in the workplace in the same manner as normal consumer use.
- All drums/bags/sacks/buckets must be properly palletized/strapped and plastic wrapped to protect against the elements. For drums (200 liter or 55 USG), pallets should contain a maximum of four drums per pallet. Odd drums (the remaining one, two or three) should be centered on the pallet. For bags/sacks/buckets, pallets should contain a maximum of 20 x 50 kilograms or a maximum of 44 x 50 lbs. bags/sacks/buckets per pallet. Odd bags/sack/buckets should be centered on the same type pallet. When Operations require partial drums for the field (e.g. acid jobs, fracs, etc.), only the amount needed should be taken. For example, if the program calls for 16 gallons from a 55-gallon drum, take only that amount to the field/point of application in a chemically compatible and secure container (e.g. jerry can, bucket with sealing lid). Transfer of chemicals to smaller containers should be performed by trained persons utilizing proper equipment at the warehouse or storage area reducing the risk of contaminating an entire drum. All containers sent to the field or used within the field must be properly identified with a permanent label. Never place any other chemicals in small containers once it has been used. After the job, dispose of all small containers properly. Unused excess chemicals in small containers can be returned for storage but must be kept separate from main chemical stocks in the small container.
- In acid jobs you are allowed a margin of error so attempts should be made to utilize whole units that are easily transferred to the field such as drums, buckets, sacks, five/three/two/one-gallon Jerry cans, etc. For instance, the mutual solvent can be between 4 to 5 % so if the calculations for the program calls for 63 gallons, just go with 55 or one complete unit. Once a chemical has been taken from its original container, never return it to its original container. The risk of contamination or even worse violent reaction is too great.



04 - CHEMICAL HANDLING, USAGE AND LABELING

- Never stick a common transfer pump suction tube into any drum you are going to re-seal. Pour-out the chemical you need. Never stick a contaminated suction hose into a drum, if you do not plan on using its entire contents. Should you need to transfer chemicals via a portable handheld drum transfer pump (offshore only), then have a dedicated pump for each specific chemical type.
- No drums should be poured in the field (unless offshore). As stated above, all disbursement from an original container must be done in the warehouse or by qualified personnel offshore. That way all you do is tighten down the bung seal, when you are done. The drum still has its original label and will not need any special storage modifications. An open drum must be so identified and must be the first choice for disbursement for the next job.

Precautions

- Extreme caution must be used when handling or using any chemical. Consult the product's MSDS before handling/usage.
- Selection of hand protection shall be based on evaluation of the task being performed, conditions present, duration of exposure, potential hazards identified, and performance characteristics of glove material. Refer to the location's PPE Hazard Assessment.
- Special precautions should be taken to avoid gloves being pulled into moving equipment.

Training

- Employees working in areas where hazardous materials are or may be used will undergo the training for specific hazardous materials consisting of:
- Review of MSDS for chemicals specific to their work environment.
- Methods and observations that may be used to detect the presence or release of a hazardous chemical in the work area.
- The physical and health hazards of chemicals in the work area.
- The measures that can be taken to protect employees from these hazards, such as appropriate work practices, emergency procedures, personal

protective equipment, and engineering controls.

- Detailed explanation of the labeling system and the Material Safety Data Sheet, and how employees can obtain and use the appropriate hazard information.
- Employee training and understanding shall be certified in a written document containing the name of the employee trained, the date(s) of training, and identification of the subject of training.

References

- ANSI Z400.1
- ANSI Z535.3
- OSHA 1910.120



05 - COMPRESSED GAS CYLINDERS

Potential Hazards

- Fire / Explosion
- Burn injuries
- Eye / Face injuries
- Asphyxiation

Procedures

- Compressed gas contained in cylinders is potentially dangerous and should be treated with care. The following guidelines shall apply to all compressed gases in cylinders and in particular to oxygen, propane and dissolved acetylene.
- The Compressed gas cylinders in use must be stored in an upright position and secured by the use of carts, racks, chains, straps, etc.
- No fittings or equipment containing above 90% copper (except burner tip) shall be used with acetylene, as copper in contact with acetylene may form a dangerously explosive compound, copper acetylated.

To avoid acetone carry-over from acetylene cylinders, the following points must be observed:

- Discharge pressure shall not exceed 9 psi at the regulator
- Settling periods as follows shall be strictly observed
- 24 hours after unloading a cylinder from a supply boat or lorry.
- 24 hours after moving a cylinder around the platform or terminal.
- The use of lead washers or any kind of packing in the valve joints shall be forbidden. Packing, particularly lead or copper, tends to get forced into the orifice causing a blockage; its subsequent extraction is attended by grave risk.
- Cylinders with faulty valve joints, stuck valve spindles, or valve leakage shall be returned immediately to stores with a note stating the cylinder number, nature of the fault and whether the cylinder is charged. Under no circumstances shall the user of the cylinder attempt any repair.
- **NOTE:** All cylinder valve spindles have right handed threads.

- Only standard valve keys shall be used and cylinder valves shall always be opened slowly by gently tapping the key. Cylinder valves shall always be closed when the cylinders are empty or not in use. Keys with long leverage should never be employed to force a valve to close. If the valve leaks when closed it is usually due to grit and this can often be removed by opening the valve slowly and closing it sharply.
- All cylinders shall have a valve protection device, either a welded-on cage or a screw on cap. Valve protection devices shall be utilized when cylinders are not in use.
- **NOTE:** The above does not apply to air cylinders for BA sets.
- Only standard automatic pressure regulators and pressure gauges shall be fitted to oxygen and acetylene cylinders when in use. Flash back arresters shall be used at both ends of the hose, i.e., immediately after the regulator and immediately before the torch. The adjustable screw on the regulator shall always be released before the cylinder is opened. The cylinder valve shall be closed before the regulator is removed.
- Compressed gas regulators must be used when connecting compressed gas cylinders to equipment.
- Safety glasses or goggles must be worn when opening the compressed gas cylinder or LPG valve.
- Employees must not stand in front of the opening of the compressed gas cylinder valve/regulator assembly while opening the cylinder valve.
- Compressed gas cylinder valve must be opened slowly.
- Compressed gas regulators and hoses should be de-pressurized when not in use.
- Oil, grease, or other combustible substance must not come in contact with compressed gas cylinders and valves containing oxygen, especially valve and regulator threads.
- Rubber hoses and other connections should be regularly inspected and damaged hoses replaced. Red hoses shall be used for acetylene and other combustible gases and blue hoses shall be used for other gases.
- Leak testing should be carried out using soapy water or proprietary leak testing fluid. Leaking equipment shall never be used. Frozen equipment



05 - COMPRESSED GAS CYLINDERS

- should be thawed out using hot water. Never use a flame to thaw equipment.
- Compressed gas cylinders (especially acetylene) and LPG tanks must not be exposed to sparks and flames from welding or cutting torches.

No cylinder shall be used if there is any doubt as to its contents. In case of doubt:

- the valve should be taped
- the cylinder should be clearly marked 'DO NOT USE'
- the cylinder should be returned to the supplier
- Cylinders, valves, regulators and hoses should be inspected before starting a job and only equipment in serviceable condition shall be used.
- Discontinue use of cylinders prior to being completely empty to leave a minimal amount of positive pressure in the cylinder.
- Compressed gas cylinders must not contact electrical circuits.

Storage and Handling

Cylinders must be stored in a dedicated area, with signage and segregation of full and empty cylinders. The following rules shall apply to storage of cylinders:

- Cylinders shall be stored with due regard to the fire hazard. No flammable materials shall be stored in the building with them or in the immediate vicinity on site.
- Smoking is prohibited in compressed gas cylinder storage and use areas.
- The cylinders shall be stored in such a manner that they can be readily removed in the event of a fire.
- Oxygen cylinders and their fittings, including hoses, must be stored separately from combustible/flammable material by at least 20 feet, or by a noncombustible wall. Oils and greases are spontaneously combustible in the presence of oxygen.
- Compressed gas cylinders must be protected from heat sources in excess of 125°F (51.5°C) and heating equipment must not be installed in store rooms where compressed gas cylinders are kept. Outside storage is acceptable if cylinders are protected from direct sunlight, heat, and standing water/corrosion.

- If oxygen and acetylene cylinders have to be stored in the same area they shall be kept well apart. Preferably they should be stored in separate areas or a minimum of 6 meters apart.
- Compressed gas cylinders must be secured in an upright position while in storage to prevent over-pressurization.

The following rules shall apply to handling and movement of cylinders:

- Cylinders should be moved by handcart, hand truck, or cylinder cart designed for moving compressed gas cylinders, when possible.
- Cylinders of oxygen, propane and dissolved acetylene shall not be subjected to rough handling or excessive shock. Dragging, sliding, or horizontal rolling or compressed gas cylinders should be avoided. Cylinders weighing greater than 50 pounds (23 kg) should be moved by mechanical means or by utilizing additional persons to assist.
- Cylinders shall never be dropped from a height or permitted to strike each other. A proper carriage or cage, NOT a sling, should be used for moving cylinders whether empty or full. Cylinders should be lifted using a wire rope sling and not a chain sling to avoid the possibility of sparking.
- Cylinder valve protection caps shall be fitted to all compressed gas cylinders and left in place while in storage.
- Cylinders shall not be transported with regulators and hoses attached unless a proper trolley is used.
- Cylinders shall be transported in an upright vertical position.

Color Coding of Cylinders

- Gas cylinders are normally color coded for identification. It is important to be able to identify cylinders readily. The following table shows typical cylinder colors and characteristic for some gases likely to be used.
- Identification of cylinders should be verified by the decal or label on the cylinder. Color coding should not be relied upon as the sole identification method as all suppliers do not consistently use the same color coding. Cylinders must not be used if there is any doubt regarding the contents.



05 - COMPRESSED GAS CYLINDERS



- Integrity Testing and Recommended Standards (ISO color code)
- Handling and Use of Compressed Air
- Extreme caution shall be taken when using compressed air. An air hose shall never be aimed at any person. Compressed air can be extremely dangerous when misused. Air under pressure may pass right through clothing and cause severe or fatal internal injury.
- Compressed air shall not be used for blowing dust / chips from hair, clothing or workbench.
- [See: Hand Tools (Pneumatic Powered Tools and Equipment)]

References

- CFR 1910.101



06 - CONFINED SPACE TRAINING

What is Confined Space?

- : Confined space is defined as any location having restricted access or egress and which is, or may become hazardous to worker. This includes trenching, elevated worksite, etc
- **OSHA:** Confined space is large enough space and so confined that an employee can bodily enter and perform assigned work but has limited or restricted means for entry or exit; and it is not designed for continuous employee occupancy

Examples of Confined Space:

- Bejana/Vessel
- Bins
- Boilers
- Ducts
- Manholes/Pits
- Pipes
- Sewers
- Tangki
- Trenches
- Tungku/Furnaces tanks
- Tunnels
- Vaults

Confined Space Entry Procedures

- Step 1 – Confined Space Identification
- Step 2 – Equipment Identification
- Step 3 – Isolation
- Step 4 – Cleaning, Purging and Ventilasi
- Step 5 – PPE
- Step 6 – Qualification and Responsibilities
- Step 7 – Atmospheric Testing
- Step 8 – Permit to work

- Step 9 – Job Performing
- Step 10 – Post Check
- Step 11 – Hazard Identification & Risk Assessment

Step 1 – Confined Space Identification

- If a space meets one of the following criteria then it is classified as confined space:
- Hazard: Does the space is closed enough and contain hazardous gas / atmosphere or other physical hazards?
- Function: does the space not design for continuous employee occupancy
- Entry & Exit: Does it has limited entry and exit so that rescue in emergency will require additional personnel and equipment?

Confined Space Classification:

- Class 1: Confined space which presently and previously doesn't contain hazardous atmosphere/gas
- Class 2: Confined space which has a possibility of hazardous atmosphere/gas but can be eliminated/controlled
- Class 3: Confined space which previously contained hazardous atmosphere/gas, or now it may have a possibility of hazardous atmosphere and those hazards cannot be eliminated/controlled

Step 2 – Equipment Identification

- Confined space data review includes, but not limited to:
- Equipment number and location
- Inside diagram of the space (mind-mapping)
- Isolation/lockout-tag out list.
- MSDS of the substance inside the "space"

Step 3 – Isolation

Isolate all energy to equipment:

- Isolate piping system



06 - CONFINED SPACE TRAINING

- Isolate electrical system
- Isolate with proper Lockout/tagout equipment

Area Supervisor must ensure all hazardous substances (toxic/flammable) has been eliminated to a safe level. Three methods normally used for process isolation:

- Single valve lock
- Blind or blank flange
- Double block and bleed

Step 4 – Cleaning, Purging and Ventilasi Puring

- Purging is replacing of hazardous/vapor with pure gas (Nitrogen (N₂)/CO₂) or steam by injecting it into the vessel. Purging may create hazards since pure gas also removed oxygen from vessel, so oxygen is downed below its permissible concentration (19,5%), So ventilating must be conducted to allow safe fresh air enter space and create breathable atmosphere in confined space.

Ventilating After Purging

After a vessel has been purged, continuous ventilating is needed to remove pure gas and, or steam and maintain oxygen level (19,5 – 23%). There are two types of Ventilation :

- Natural Ventilation: Using natural air flow to remove contaminant from confined space
- Mechanical Ventilation: Air flow is generated by mechanical device / fan to remove air contaminant from confined space

Natural ventilation can produce adequate air flow in certain circumstances. Due to equipment design and surrounding environment, also temperature and wind direction changes, it's difficult to maintain adequate and continuous air flow into confined space. This type of ventilation is not recommended, except in a certain circumstances

Mechanical Ventilation

- Mechanical Ventilation is divided into 2 categories:
- Local Ventilation: Exhaust ventilation that gives a means to remove contaminants by exhausting it at its source
- General ventilation: General ventilation means to supply outside air which's clean generated to all parts of room continuously

There are two systems on General ventilation:

- Blower system – blowing outside to inside using fan
- Exhaust system – Exhaust inside air to outside

All type of mechanical ventilation is suitable for all confined space job. But selection of equipment type depends on:

- Characteristic of contaminant
- Confined space configuration
- Type of job will be performed inside confined space

Some Mistake on Air Ventilator

Air Ventilator is Too Small / Air ventilator capacity doesn't suit with work area – If air ventilator is too small, then air flow will not be adequate to maintain safe atmosphere to workers. Size of air ventilator depends on the size of work area and the amount of air flow required for the job. Time at air replacement – Time for air replacement and volume must be defined by a competent person such as engineer, because each confined space and activity requires different air flow

Confined space configuration

Because every confined space is unique, design and obstacle may cause improper ventilation.

- A diagram of internal configuration will assist in identification of ventilation problem and gives a correction prior entering confined space.
- Air ventilator may be equipped with a flexible ductwork to direct air flow. Some



06 - CONFINED SPACE TRAINING

air ventilator can be used at the same time or a baffle system may applied to direct the air

Step 5 – PPE

- ...



Step 6 – Qualification and Responsibility

During confined space work are taken places, safety watch must:

- Maintain communication with personnel working inside confined space
- Notify personnel working inside confined space should there any changes or unusual condition
- Monitor life support system used in confined space job
- DO NO other activity which can reduce his attention to personnel inside confined space
- Record any personnel and material entering and leaving confined space
- Stay at his point until the other competent replace him
- Have authority to abandon the confined space job if required
- Only qualified, well trained and experienced safety standby can do this job !!
- Rescue personnel must have been trained such as safety stand by and also well trained in Industrial Rescue Training
- Minimum 2 rescue personnel are familiar with CPR (Cardio-Pulmonary Resuscitation) and first aid standard
- Only rescuer with mentally and physically fit are allowed working in confined space and doing rescue operation
- Rescuer must familiar with lay out and diagram of the confined space
- Only qualified, well trained and experience rescuer can do this job

Remember:

- Fire watch must have been trained such as safety standby and also well trained in fire fighting
- Fire watch also must be familiar with confined space operation and lay out.
- Only qualified, well trained and experienced Fire watcher can do this job

Step 7– Atmospheric Testing

- Gas test must be taken place at initial time and periodically to ensure safe atmosphere
- Job cannot be performed should it detect a potential of gas release which

06 - CONFINED SPACE TRAINING

may lead to fire or explosion and toxicities

- Safety precaution must be taken for tank/vessel cleaning or fuel filter replacing, due to residue of pyrophoric oxides/ iron sulphides which has auto ignite ability if exposed against oxygen
- All working area must be comprehensively tested prior to start a job in hazardous potential atmosphere

Normal atmosphere density defines as 1 other gas refer to this number, if heavier/ lighter than air the value will be above or below 1. The following chart indicate the density of other gas whether heavier or lighter than air

Step 8 – Permit to work

- Permit to work only valid for a time period stated on the permit
- Permit must be prepared by an authorized personnel (normally supervisor or his designate person)
- Permit must be post it clearly in the entrance of confined space
- All issued permit must be recorded
- Permit must be returned as completion of the job, or has been expired or because of something the permit should be returned (emergency).
- Permit must be kept for a period of time. For permit must be retained for at least one year

Step 9 – Job Performing

- Pre use inspection must be conducted for PPE, gas tester, emergency apparatus etc.
- Conducting pre-job safety meeting to discuss work procedure, potential hazards, emergency plan, etc.
- Proper placement of working equipment, or emergency apparatus use confined space checklist.
- Check isolation that has been installed, use isolation checklist.
- Perform work in compliance with JSA / SOP

Ensure during work performing every procedure is followed and every personnel on his role and wear PPE as per PRAC recommendation

Step 10 – Post Check

Final inspection required to ensure that everything has been returned to its normal condition, check the following:

- Check that there's no equipment/tools left behind
- Make sure all personnel have left the confined space.
- All isolation has been opened and on the right position.
- All permit has been returned to PTW control point and closed

Rescue Procedure in Confined Space, Rescue Planning Must be discussed and ensure all personnel understand the following:

- Equipment.
- Personnel's role.
- Agreed command.
- Safe area.



07 - CRANES AND FORKLIFTS

Application

- All field locations where there is a requirement to use cranes, forklift and trucks.

Procedures

- All cranes shall have a valid test certificate.
- All crane operators shall have valid license.
- All cranes are subjected for annual inspection by the Independent Third Party.
- All forklifts shall have a valid test certificate which is valid for 12 months period.
- All forklift operators shall have a valid license.
- shall permit only fully certified operators to operate mobile equipment, forklifts and cranes at location.
- Cranes shall be inspected daily by a competent person. Daily inspection record sheets which are signed by the competent person and crane operator shall be maintained and available for COMPANY review.
- Crane maintenance shall be carried out and recorded based on the crane manufacturer's preventive maintenance program.
- All crane hooks shall have a safety latch fitted to prevent accidental displacement of load and shall be inspected daily for deformation or cracks. Hooks with cracks or having 15% more than normal thread opening or more than 10% twist from the plane of the unbent hook shall be discarded.
- shall permit only fully certified operators to operate mobile equipment, forklifts and cranes at location.
- Cranes shall be inspected daily by a competent person. Daily inspection record sheets which are signed by the competent person and crane operator shall be maintained and available for COMPANY review.
- Crane maintenance shall be carried out and recorded based on the crane manufacturer's preventive maintenance program.
- All crane hooks shall have a safety latch fitted to prevent accidental displacement of load and shall be inspected daily for deformation or cracks.

Hooks with cracks or having 15% more than normal thread opening or more than 10% twist from the plane of the unbent hook shall be discarded.

- A dry chemical fire extinguisher of at least 10 kilograms shall be affixed to every crane.
- All cranes shall be fitted with an automatic, anti-two blocking device or be fitted with an indicator, such as a flag tied to the load line above block, readily visible to the operator to warn of imminent two blocking.
- All control levers, pedals and switches shall be fitted with locking devices to prevent accidental movement.
- All cranes shall have momentary type controls which return to their neutral position when released



07 - CRANES AND FORKLIFTS

- All cranes shall be equipped with limit switches which prevent the boom from travelling past its top and bottom stops and maximum load limiting equipped with a signal, which will actuate until corrective action is taken.
- All control levers, pedals, and switches shall have a schematic affixed nearby stating their purpose and mode of operation.
- A load chart shall be fitted, visible to the operator, showing the radii and safe working load of the main and auxiliary hook blocks. The correct rigging diagram shall be within easy view of the operator.
- Crane booms should be left in a stable condition at the end of each workday or anytime the crane is left attended.
- Cranes walking with suspended loads should have a flagman and the load restrained from swinging by use of a tag line or by attaching restraining lines back to the crane body.
- Suspended loads which are totally or primarily supported by the crane shall not be left unsecured or unattended at any time.
- There shall be an effective system of communication between the person supervising cargo handling and the crane operator.
- Standard hand signals shall be posted or a clearly visible rigging director.
- Potential hazards.
- Contractor crane /forklift certification.

Remember

- All cranes and forklifts must be fitted with an audible reversing alarm.

References

- See: Chemical-Handling / Usage / Labeling
- See: Hazardous Area's Div. I, II, III]



JOS's CRANES & FORKLIFTS HAVE VALID TEST CERTIFICATES



08 - DOCUMENT CONTROL

Purpose

- This Procedure Describes the Process for Control of Existing & New Documents.

Responsibilities

- Document Controller is Responsible for The Implementation and Maintenance of the Documentation System Defined in This Procedure.

Procedures

- Company Procedures: New procedures should be developed as needed to address safety, health, and environmental risks which apply to all operations.
- Procedures should be developed /reviewed by a team of engineering operations, Health & Safety Staff, and led by the Loss Prevention & Environmental production Department Manager.
- Site Specific Procedures: Site Specific procedures should be developed as needed.
- Procedures must be at least as stringent as any applicable Company procedure, if applicable.
- Procedures should be developed for site specific risks not addressed by a Company procedure.

Quality Assurance

- All documents must be checked for acceptance of standard format (format, index, numbering system).

Review: The guidance for reviewing Documents

- Policy annually
- Standards and Procedures: every 2 years

Storing and Recording

- A designated document controller will be assigned to maintain and store current procedures. Site specific document controllers may be required to manage site specific procedures.

Distribution

- New and revised LP & EP procedures must be distributed to all sites. All employees and contractors must be made aware of procedures and requirements which will affect their work at locations.

Standard Format

- **Purpose:** This section details the object or intention of the Standard/ Procedure. In the case of a revision to an existing Standard/Procedure, this section should specify additional objectives to be controlled or detail the changes to existing ones.
- **Application:** This section shall outline the activity and department, division or personnel to which the document is applicable and the extent of activities that are to be controlled.
- **Definitions:** This section shall provide common definitions of words, abbreviations or actions not readily understood. Definitions will be listed in alphabetical order.
- **References:** This section shall list and fully describe all other documents referred to by the procedure. These may include other procedures or appropriate Codes and Standards. Each reference shall be numbered and identified within the text of the procedure



08 - DOCUMENT CONTROL

Responsibilities

- This section shall provide who are accountable and/or responsible on the compliance, implementation, and maintenance of the Standard/ Procedure.
- Flowchart and Procedure
- Whenever possible Standard/Procedures should be center around a flowchart of activities and written information used to support and explains the flowchart.
- The text should be sufficiently detailed to provide a precise description of an activity or action.
- The wording should be concise and tailored to the skill level of the individuals responsible for the activities controlled by the procedure.
- Flowcharts shall be presented in a manner that reflects the order that the activities are to be performed.
- All documents/reporting requirement, including those required for statutory purposes, are to be specified at the appropriate point in the flowchart procedure.



JOS's DOCUMENT CONTROL GUIDELINES IMPROVE OPERATIONAL EFFICIENCY IMPROVE OPERATIONAL EFFICIENCY AND ACCURACY



09 - EMERGENCY RESPONSE PLAN

Purpose

- This is to ensure that all personnel are familiar with emergency response plans and follow the emergency response procedures. All employees may be requested to act in various capacities during critical aspects of an emergency.

Procedures

Company Emergency Response Plan

- Must be available at all Offices. It contains essential information required by the applicable department personnel to deal with emergencies.
- Local Emergency Response Plan
- Must be developed for locations and facilities according to the applicable corporate standard. Manuals must be available at the appropriate facility or office.

Location specific Contingency Plans

Location specific emergency response plans shall as a minimum include:

- Clear definition for people on or at the production location, their roles and responsibilities in the event of an emergency.
- Clearly defined emergency situation and the roles and responsibilities of those assigned to them.
- General arrangement drawing/plans showing the layout of all emergency equipment for the production facility in question.
- Clear and unambiguous information as to how the facility shall be evacuated in the event of an uncontrolled situation.

Clear description of events that might be classed as emergencies, they shall include but be not limited to the following:

- Situation specific contingency plan(s) must be prepared in all cases where e.g. sour gas will be encountered and may be required under other circumstances as deemed necessary.

Oil Spill Containment & Recovery (OSCAR)

- Equipment is available at various locations. Emergency Response Team should have knowledge of its locations and how to activate its use.

Emergency Evacuation

- Must be included as part of a local or site-specific Emergency Response Plan.
- E-R-T (Emergency response team)



09 - EMERGENCY RESPONSE PLAN

Responsibilities

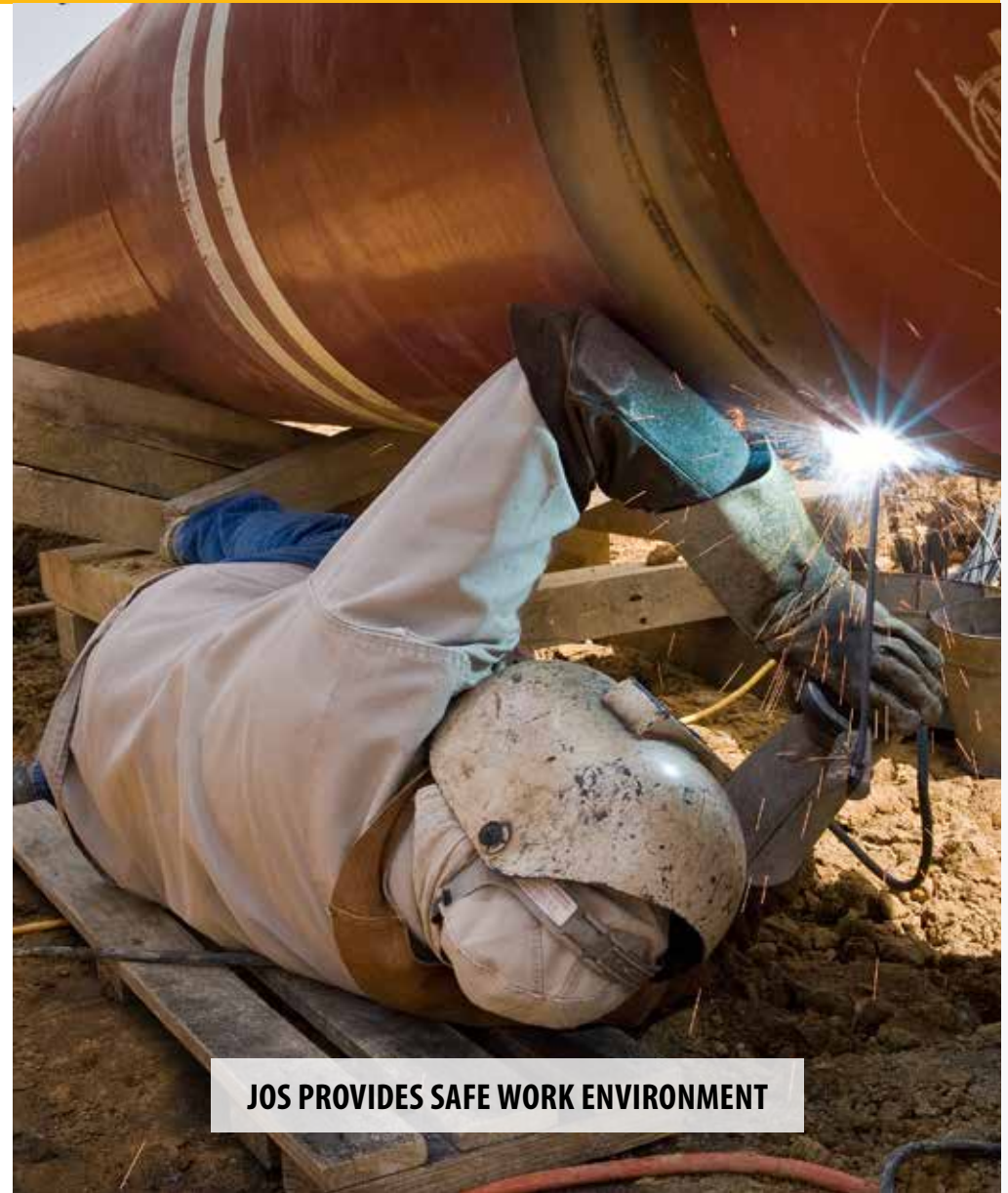
- In the event of an emergency, the employee In-charge will be the on-scene Commander until more senior personnel are on-site and are able to take over responsibility.
- Each department is responsible for ensuring that contact list revisions are communicated to HSE Department, who will then issue the revised contact list.
- Local Emergency Response Plan training shall be employed at all fields locations, which should have realistic exercises/drills every 2 weeks, and the Incident Management Team (IMT) should have full scale Emergency Exercise annually, and special training must be maintained current by the Local Management.

Training

- Local Emergency Response Plan training shall be employed at regular intervals as appear necessary, to ensure that all company personnel know how to use the plan and respond to an emergency. Employees shall be trained in essential functions. Special training must be given to designated persons responsible for special functions. All training shall be documented.
- Rehearsal and review should be done every second year or when significant changes occur in the overall operation and plan.
- All facility/location managers and their respective emergency response teams shall undergo specific training and assessment in the management of major emergencies (MOME).

References

- OSHA 3122 – 06R (2004)



JOS PROVIDES SAFE WORK ENVIRONMENT



10 - EXCAVATION

Purpose

- This Procedure Describes the Process for Control of Existing & New Documents.

Responsibilities

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- Company Procedures: New procedures should be developed as needed to address safety, health, and environmental risks which apply to all operations.
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Quality Assurance

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10 - EXCAVATION

Responsibilities

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- Flowchart and Procedure
- Whenever possible Standard/Procedures should be center around a flowchart of activities and written information used to support and explains the flowchart.
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- The wording should be concise and tailored to the skill level of the individuals responsible for the activities controlled by the procedure.
- Flowcharts shall be presented in a manner that reflects the order that the activities are to be performed.
- All documents/reporting requirement, including those required for statutory purposes, are to be specified at the appropriate point in the flowchart procedure.



JOS IS KNOWN FOR MAINTAINING STANDARDS



11 - HAND AND POWER TOOLS

Potential Hazards

- Injury from substandard hand tools
- Electrical shock
- Improper routing of cables
- Uncontrolled pressure
- Improper use
- Source ignition
- Noise
- Fire

Procedures

- Only tools suited to the job shall be used, improvised tools must not be used.
- Damaged or worn tools should be repaired or replaced.
- The Designated Supervisor shall be responsible for implementing a 3 monthly inspection of hand tools

Example

- Non-Sparking tools should be used in flammable environments.

Electric Powered Tools

- Have a fail safe device such that they stop automatically when the operator releases hold
- Tools shall only be used by trained, authorized personnel
- A chuck key of the correct type only shall be used to operate chucks.

Pneumatic Powered Tools

- Pressure regulators shall be used where necessary to ensure that the manufacturer's pressure rating for each tool is never exceeded.
- Only sound, strong hoses with secure couplings and connections shall be used.

- Where sparking or heat generated by use of a tool could represent a hazard, a coolant should be used to disperse heat and reduce the possibility of sparks.
- All users of compressed air lines shall fit 'whip checks' and safety pins to crows foot connectors on airlines.



12 - HOT WORK

Purpose

- To provide clear guidance of what constitutes hot work and allow effective control of such procedures within the permit to work system.
- Any exception to this policy requires management approval.
- Application
- All locations
- Potential Hazards
- Fire/explosion
- Personnel Injuries
- Combustible / toxic fumes

Definition

- A hot work permit is required when the work can generate sufficient energy to produce a potential source of ignition. This may vary from, but not limited to grinding, arc, spark, open flame, and use of non-intrinsically safe equipment.

Examples

- Welding
- Shrink Sleeve Blower
- Oxy/acetylene Torches
- Soldering Equipment
- Open flame
- Hilt Gun
- Electric Power Tools
- Opening explosion proof or purged enclosures in a classified area.
- Abrasive Wheels
- Grinding Tools
- Hot tapping
- Sand/grit blasting
- Controlled burning
- Flare pits

Recommended Procedures

- Where practical, all combustibles will be relocated a minimum of 10m horizontally from the work site. Where relocation is impractical, combustibles will be protected with fireproof covers or shielded by metal walls or fiberglass blankets. Openings or cracks in walls, floors, drains or ducts within 10m of the site will be tightly covered in order to prevent the passage of sparks to adjacent areas

Prior to hot work commencing, the Senior Supervisor shall ensure:

- A Hot Work Permit is obtained, according to the Permit to Work Program.
- Drains are plugged to prevent back flow of vapors.
- The draining, venting or purging of equipment and lines is completed.
- A gas test for combustible vapors has been made. (Applicable on hydrocarbon producing and/or processing platforms and in the vicinity of stored chemicals or hydrocarbon products). A 0% reading for LEL is required for Hot Work.
- The wind direction will not cause any flammable vapor from distant vent, to migrate to the hot work area.
- The other side of the plate or tank plate or vessel is clean and free of flammable material.
- Vessels or other enclosures are clean and free of flammable material.
- A fire watch and extinguishing equipment are present and operable. For fire watch guidelines during welding or cutting torch operations refer to paragraph 8 (Fire Watch Guidelines) During hot work other than welding or cutting torch operations, a member of the work team may act as fire watch while work in which he is not performing a task takes place.
- Under no circumstances will compressed oxygen be used for ventilation or to blow through an acetylene hose. Explosions can occur when acetylene gas is present in air in any proportion between 2.2% and 80% by volume.
- When working at a height, precautions shall be taken to prevent welding rods, stubs and slag from falling.
- On hydrocarbon producing locations, or in the vicinity of stored chemicals or hydrocarbon products, gas testing for combustible vapors shall be made



12 - HOT WORK

periodically while hot work is in progress, or continuously if necessary.

- Pipelines which cross the location must be protected from the hot work and checked for leaks. They must not be subject to weld splatter and sparks or used as the ground for welding return currents.
- All hot work shall be performed as far removed from wellheads and production equipment as possible.
- supervisor (Production Supervisor, Assistant Supervisor, Construction Representative or Drilling Supervisor) familiar with the operating process shall be on site until the hot work operation is completed and shall ensure the compliance with all requirements on the Hot Work Permit is complied with.
- All personnel involved in hot work activities must be alert to the dangers of fire and explosion. No work is permitted in the presence of flammable atmospheres, or where flammable atmospheres may develop due to unclean or improperly prepared drums, tanks or other containers, equipment which may have previously contained flammable materials, or in areas which may develop an accumulation of combustible dusts.
- Special precautions should be taken when cleaning out tanks and vessels or changing fuel gas filters, as the residue encountered may contain pyrophoric substances. These substances, consisting mainly of oxides or iron sulfides, may ignite spontaneously if allowed to dry out. Special precautions must be taken for their safe disposal.

Welding and Cutting Guidelines

- Welders' and helpers' personal protective equipment is to comply with ANSI/ACS Z49.1 specifications or equivalent and the Personal Protective Equipment Policy and Procedure.
- Prior to welding, cutting, burning or brazing on tanks, vessels or equipment, the Senior Discipline Supervisor shall ensure they are free from flammable gases and vapors, oil or sludge. When vessels and tanks are being welded or burned on the outside, there is a danger of toxic or flammable gases

collecting within the vessel or tank. Particular care is to be taken to ensure adequate ventilation and/or respirator protection. This is especially relevant in confined spaces. Refer to separate Confined Space Entry Policies and Procedures for more detail.

- Safety meetings shall be held prior to commencing welding or cutting and at break points such as shift changes, etc.
- Where hardened deposits are present in the vicinity of an area to be welded or cut, and it is not intended to remove these deposits, welding or cutting shall not start until the makeup of the deposits is determined
- Toxic gases and fumes produced by welding can create serious hazards; therefore, proper ventilation should always be assured and required respiratory equipment utilized. Examples of toxic gas and fumes produced by welding are as follows:
 - Nitrous fumes may be produced if an oxyacetylene flame is permitted to impinge on a large section of metal for long periods during gas welding.
 - Gas welding may produce carbon monoxide.
- Arc welding of iron or steel produces fumes consisting of very fine particles of iron oxide.
- Welding brass, bronze and manganese generates large quantities of carbon monoxide and carbon dioxide.
- Lead based paints emit lead fumes when welded or cut.
- The welding or cutting of coated materials shall only be carried out when adequate means of removing the fumes are available, or adequate respiratory equipment is utilized. The application of any oxyacetylene flame to metal coated with metallic lead, zinc or other substances may emit highly toxic vapors. This is particularly true where an excess of oxygen is required.
- **Caution:** Welding and X-ray will set off ultra violet fire detectors and smoke detectors. These fire detection systems should be isolated during hot work.



12 - HOT WORK



Fire Watch Guidelines

- An individual assigned to fire watch shall visually monitor all welding or cutting torch operations. A minimum of one fire watch, whose sole duty is that of fire watch, is required on each location. When cutting through a bulkhead, roof or steel decking a fire watch shall be present on both sides.
- The fire watch will:
 - Have fire-extinguishing equipment present and trained in its use, including practice on actual fires.
 - Be familiar with facilities, and procedure for sounding an alarm in the event of a fire.
 - Watch for fires in all exposed areas, particularly on the blind side of bulkheads and walls, and try to extinguish them when obviously within the capacity of the equipment available, or otherwise sound the alarm immediately.
- Maintain a fire watch for 30 minutes after completion of cutting or welding operations in order to detect and extinguish possible smoldering fires, including an inspection of adjacent compartments that may have been affected.
- Gas testing for combustible vapors shall be made continuously while welding or cutting torch operations are in progress.

Welding Equipment Guidelines

- All diesel-welding machines shall be fitted with spark arresting mufflers. Welding machines shall be shutdown anytime the job is left unattended and during refueling.
- The welding return current clamp shall be set at the work site or within 3m of the work site when practical. The return current clamp shall always be visible to the fire watch.
- Welders shall never coil gas hoses or welding leads around their body when burning or welding.



12 - HOT WORK

Oxygen/Acetylene Equipment Guidelines

- Cylinders of oxygen, acetylene or propane are never to be taken into a confined space. Gas hoses and welding leads are not to be taken into a confined space until immediately prior to their use. Likewise, they shall be removed when not actively being used. Where this cannot be done, the oxygen and acetylene connections shall be disconnected at the cylinders situated outside of the confined space. Closing the valve is not a disconnection.
- Oxygen and acetylene hoses shall be turned off at the cylinder valve anytime the equipment is not being actively used. A check valve shall be installed in both the oxygen and acetylene lines. A flashback arrester shall be installed adjacent to the acetylene regulator valve.
- Oxygen and acetylene shall be stored separately in an upright position, protective caps on and secured in place. Preferably, the oxygen and acetylene shall be stored in separate well ventilated areas. A minimum of 6m or a non-combustible wall should separate the two types of cylinders. Cylinders in welding carts or mounted on vehicles need not be separated.
- Cylinders shall be transported and used in a cradle made to hold the cylinders. The cylinders shall be in a vertical position in the cradle

Electrical Hot Work

- The opening of explosion proof or purged enclosures in classified areas that house powered-up arc producing devices, i.e. a source of ignition, is considered hot work.
- Precautions must be taken when such boxes or enclosures are opened including continuous gas monitoring throughout the period that the box is open and the provision of a designated fire watch.
- Opening explosion proof boxes that are located within purged control rooms or at any location when the power is off and isolated does not constitute hot work.

References

- OSHA CFR 1910.106,252,253,254,255
- API RP 54
- API PUBLICATION 2201
- NFPA 30
- AESC, HOT WORK



13 - HOUSEKEEPING

Potential Hazards

- Slipping
- Tripping
- Fire
- Falls
- Crushing
- Caught Between (Pinned)

Procedures

- Poor housekeeping practices are responsible for many accidents in the work place. With a little effort, this problem is easily eliminated.
- Good housekeeping practices include keeping tools, materials, equipment, buildings, and properties clean and in good order.
- Good housekeeping is the day-to-day responsibility of all employees and is a continual process. Periodic cleanups, or cleanups when time permits, is not considered to be adequate.
- Tools and materials shall not be scattered around the walking or working surfaces while the job is in progress.
- Haphazardly scattered tools, equipment and materials are an invitation to an accident.
- No job is complete until tools have been cleaned and properly stored, scrap and waste materials disposed of, and the equipment and work locations is in good orderly condition, and approved for continues operation.
- Sharp and pointed tools shall be stored properly. Leaving such tools lying around loose creates an unnecessary hazard.
- Slick spots on the walking surface caused by water, oil or other substances shall be cleaned up immediately. Allowing this condition to exist, even for a short period of time, is dangerous.
- Waste rags, trash, etc., must not be permitted to accumulate, it should

be properly disposed of as soon as possible.

- Materials or equipment delivered to the job site shall be kept well away from the working area until needed.
- Protruding nails, straps, or wire shall not be permitted to exist in the work place. They shall be removed immediately when found.
- All material to be stacked shall be cross-tied or otherwise secured so that it will not fall over. Rolling stock such as pipe should be checked so it cannot roll onto an employee.
- Aisle ways and walking surfaces shall always be kept clear of materials and equipment as much as possible.



14 - LADDERS

Purpose

- To provide direction for the design and installation of fixed ladders, stairs, and platforms.

Application

- All plant and field locations.

Potential Hazard

- Slips/trips and falls
- Electricity

Procedure

- The usage of fixed ladders, stairs, and platforms should comply with Specifications



15 - LIFTING DEAR

Potential Hazards

- Failure of lifting equipment under load causing serious injury and loss/damage to process or equipment.

Lifting Equipment

- Category I - Slings ,come- alongs
- Category II - Miscellaneous Hardware
- Category III - Special Appliances and Fixtures
- Lifting gear table

Category I - Slings

- Wire rope slings (including those attached to cargo containers, etc).
- Alloy Steel Chain slings
- Metal Mesh Slings
- Natural and Synthetic Fiber Rope Slings
- Synthetic webbing slings
- Cargo nets
- Personnel baskets (include due to critical nature of equipment)
- Passenger and service lifts
- Chain blocks
- Come-along

Category II - Miscellaneous Hardware

- Pulleys (pulley blocks, snatch blocks, sheavers)
- Eye bolts
- Hooks
- Come - alongs
- Plate clamps (including attached slings)
- Air Tuggers
- Cargo containers
- Shackles
- Barrel hooks
- Other similar hardware

- Win rope slings (including those attached to cargo containers, etc)
- Chain slings
- Nylon polyester belt slings. Note: from Cat. I

Category III - Special Appliances and Fixtures

- Cargo baskets
- Hoist runway beams
- Special - lifting tools, support, and stands
- Spreader bars (frames)
- Cylinder Racks
- Barrel racks
- Transportable tanks

Repair or Alteration

- Any item of lifting equipment of category III which has been repaired or altered in any way from its original configuration should be load tested and certified according to this procedure before it is used.
- Contractor/sub contractor lifting equipment used on offshore and onshore facilities shall comply with the intent of this standard. The contractor must use this standard or some other appropriate procedure that ensures compliance with this policy. This will be mutually agreed by and the contractor (bridging document).
- Policy compliance shall be communicated in pre-tender information. Proof of certification and ongoing re-certification will be produced upon demand.



16 - LIFTING OPERATIONS

Purpose

- To provide a Standard for safe lifting operations to provide safety of personnel, equipment, facility, and environment while lifting loads by crane, derrick, or other lifting equipment.

Application

- This Standard applies to all lifting activities including loading/unloading cargo, other lift handling of persons within locations.

Potential Hazards

Power line contact, overloading, un-determined load weight, outrigger failure (soft ground and structural), two-blocking, pinch point, unguarded moving parts, unsafe hooks, hook caught on, obstruction of vision, sheave-caused cable damage, cable kinking, side pull, boom buckling (from striking objects), access to cabs, bridges, and/or runways, control confusion (non-uniform location), turntable failure, removable or extendible counterweight systems.

Operator Requirements

The Site Leader shall assign a designated person to operate, maintain, repair and inspect all hoisting machinery and rigging equipment prior to each use, and during use, to make sure it is in safe operating condition.

- The crane operator, must meet all requirements for certification and demonstrate competency skill and acknowledge for operating the Crane.
- Annual or when required Refractory Check shall be conducted for Crane Operator.
- Riggers, signalers, and others who involve with lifting work by crane, shall have rigger qualification and certification.

Crane Requirements

Crane shall be equipped with the following:

- Counterweight as specified by the manufacturer for mobile crane.
- A serviceable, approved fire extinguisher, which is readily accessible to the operator.
- A serviceable and adjustable seat.
- Guards for personal protection over all exposed moving parts, which are considered hazardous under normal operating conditions.
- Boom angle indicator
- A device to determine that the crane is level for all mobile crane operations.
- A 100-foot (30.5 meters), non-conducting tape measure.
- An audible horn or bell-signaling device.
- Safety Devices: anti two block, boom stopper, swing brake, parking break.
- Manufacturer approved load chart mounted in the cab, which is correct for the counterweight, boom and jib supplied,
- A logbook (running hours, maintenance)
- A maintenance and inspection program for the crane and boom shall be established and followed.
- The crane shall be supplied with wire ropes equivalent in size, grade, and construction to those recommended by the crane manufacturer
- The weight and capacity of crane shall be permanently and legibly marked on the blocks, equalizer beam, dragline, clamshell, concrete buckets, and any other accessories that contribute to the load, handled by the crane.
- Length and serial number are permanently and legibly marked on all boom and jib sections.
- No lifting machinery, crane or derrick, nor rigging equipment having a visible or known defect that affects safe operation shall be used.
- All exhaust pipes shall be guarded or insulated in areas where contact by employees is possible in the performance of normal duties.



16 - LIFTING OPERATIONS



Operator's cabin

The cabin, controls and mechanism of the equipment shall be so arranged that the operator have a clear view of the load or signalman, when one is used. Any deviation to the above condition, the following options shall be followed:

- A single band radio shall be provided for communication between signalman and operator.
- A series signalman system shall be in place. Only one dedicated signalman who is visible to the Crane Operator.
- Cabin glass shall be safety plate glass or equivalent. Cranes with missing, broken, cracked, scratched, or dirty glass (or equivalent) shall be rectified immediately. Cabin glass that impairs operator visibility shall not be used.
- Clothing, tools and equipment shall be stored so as not to interfere with access, operation, and the operator's view.

Operating Controls

- All control mechanisms such as: operating controls, braking, locking and maneuvers (radius indicator) shall be operable, properly maintained and in safe condition. Those operating controls shall be clearly marked, or a chart indicating their function shall be posted at the operator's position.
- Wind-indicating devices shall be available. In case of offshore crane, wind-indicating devices could be located at radio room.
- For cranes located on marine vessel, Pitching and rolling indicating devices shall be available.
- Allast or counterweight shall be located and secured only as provided in the manufacturer's specifications, which shall be available.



16 - LIFTING OPERATIONS

Access, ladders, stairways, stanchions, grab irons, footsteps or equivalent means shall be provided as necessary to ensure safe access to foot-walks, cabin platforms, the cabin and any portion of the superstructure which employees must reach:

- Foot walks shall be of rigid construction;
- Fix Ladder shall be equipped with cage.
- Stairways on cranes shall be equipped with rigid handrails.
- If any position of employee on the ladder or stairway could be strike by crane's maneuver, a prominent warning sign shall be posted at the foot of the ladder or stairway. A system of communication (such as a buzzer or bell) shall be established and maintained between the foot of the ladder or stairway and the operator's cabin.
- Wood blocks or other support shall be of sufficient size to support the outrigger, free of defects that may affect safety and of sufficient width and length to prevent the crane from shifting or toppling under load. Crane operator is responsible to ensure that outriggers are properly seated and the cabin position is leveled.
- Engine exhaust gases shall be discharged away from the normal position of crane operating personnel. Engine exhaust shall be equipped with a spark arresting type silencer.
- Electrical equipment shall be located or enclosed that live parts will not be exposed to accidental contact. Designated persons may work on energized equipment only if necessary during inspection, maintenance, or repair.
- At least three full turns of rope shall remain on un-grooved drums, and two turns on grooved drums, under all operating conditions. Wire rope shall be secured to drums by wedges and clamps or equivalent means. Fiber rope fastenings are prohibited.
- Mobile crane booms being assembled or disassembled on the ground with or without the support of the boom harness/cradle shall be blocked to prevent dropping of the boom or boom sections.

Brakes

- Each independent hoisting unit of a crane shall be equipped with at least one holding brake, applies directly to the motor shaft or gear train.
- Each independent hoisting unit of a crane, except worm geared hoists, the angle of worm is to prevent the load from accelerating in the lowering direction, shall, in addition to a holding brake, be equipped with a controlled braking means to control lowering speeds.
- Holding brakes for hoist units shall have not less than the required percentage of the rated load hoisting torque at the point where the brake is applied.
- All power control braking means shall be capable of maintaining safe lowering speeds of rated loads.

Derricks

Derrick operations shall be directed only by the individual specifically designated for that purpose.

- **Note:** Maximum load shall be 90% of rating of derrick SWL.
- For permanently installed derrick, durable and clearly legible rating chart must be provided with each derrick and securely affix where it is Visible to personnel responsible for the safe operation of the equipment. Charts shall include manufacturer's approve load rating, specific length of component on which the load ratings are based, required parts for hoist revving.
- For non-permanent installation, the manufacturer must provide sufficient information from which capacity chart can be prepared for the particular installation. The capacity charts must be located at the derrick and the job site office.



16 - LIFTING OPERATIONS

Crane Lifting Operations

Critical Lifting

No crane will be loaded beyond its rate capacity. A Critical Crane Lifting Plan and Permit To Work shall be made for the following conditions:

- At any time during a lift, the load is 80% of the crane SWL will be exceeded.
- Irregular shape e.g. concrete, plate, pipe, rods, etc.
- Valuable material (see high risk level cost)
- Hazardous material
- Weather (maximum wind speed 25 knots)
- Rolling and Pitching
- Any time such as a lifting crossing the process plant, accommodation, etc.
- For more than 80 ton mobile crane
- When the crane operator has no experience to lift a specific load.
- For complex lifting, JSA shall be thoroughly analyzed (e.g. tandem lifting)
- Crawler crane travels with load.
- At any time the Site Leader feels there is a requirement.

Remember:

- No lifting shall be conducted when wind speed >36 knots. Only emergency lifting (safety of life) can be proceed with multi discipline risk assessment and site leader approval.
- Conduct pre-inspection prior to lifting at the beginning of the day for crane access ladders, walkways and hatches, pre-start checks, housekeeping of machine, structure, cabin, and personal belonging, prime movers, over-hoist limits/cut-outs, rated capacity indicators, emergency load release and gross overload protection system, emergency engine stops, safety equipment, fuel. An SOP for this inspection shall be provided.
- The operator shall refer to Crane Operation checklist prior to starting the crane.
- Hand signals to crane and derrick operators shall be those prescribed by the applicable ANSI standard for onshore use. An illustration of the signals shall be posted at the job site and visibly maintained.

- The crane operator is must be aware of all those personnel designated as Rigger and Signalman.
- Designated signalman shall be equipped with specific sign on his uniform for each lifting.
- The crane operator, signalman, and rigger shall have the same band of radio communication.
- Maintain visual contact with the signalman. Lifting operations must cease if visual contact is lost. These operations can only recommence when a clear line of vision is re-established.
- Crane operator shall only respond to clear hand or radio signals given by the signalman. Unless in emergency situation, the crane operator may response to other person for emergency stop.
- Load must be vertically lifted at any time.
- All employees shall be kept clear of loads about to be lifted and of suspended loads.
- Accessible areas within the swing radius of the rear of the rotating superstructure of the crane or any hoisting machinery shall be free and signed to prevent any personnel from being struck or crushed by the crane.
- Put cargo and material in the designated place. Do not obstruct any access and egress.
- Cargo handling operations shall not be carried on when noise-producing, maintenance, construction or repair work interferes with the communication of warnings or instructions.
- Cargo of hazardous materials shall be handled and lifted in accordance with materials safety data sheet (MSDS) and/or packaging rules.



16 - LIFTING OPERATIONS

Workplace and Housekeeping

- All hazardous cargo shall be slung and secured so that neither the draft nor individual packages can fall as a result of tipping the draft or slacking of the supporting gear.
- All chemical or oil drums shall be lifted in a certified steel half-height container (see picture), or tote tank, cargo net, which will not cause drums to fall. Pallets are purely used for allowing forklift truck to transport cargo along flat solid ground/deck, NOT FOR CRANE LIFT.
- Pallets are purely used for allowing forklift truck to transport cargo along flat solid ground/deck, NOT FOR CRANE LIFT.
- Pre-lift safety meeting shall be attended by the crane or derrick operator, signal person(s). This meeting shall be held prior to lifting at each new work location, and shall be repeated for any personnel involved and newly assigned to the operation.
- The Site Leader or other authorized person shall post operating instructions for high wind conditions in the operator's cabin of each crane.
- Night Lifting can be performed with sufficient illumination (300 fluxes).

Attaching the load

- Use the proper sling size and type
- The sliding choke sling shall not be used. Double wrap type may be used with shackle to secure the load.
- The load shall be attached to the hook in accordance with API rigging requirement.
- The operator shall aware that the hook load is within the crane's applicable static or dynamic rated load at the radius at which the load is to be lifted.

Moving the load

The load shall be well secured and properly balanced in the sling or lifting device before it is lifted more than a few inches.

- Before starting to hoist, the following conditions shall be noted:
- Hoist rope shall not be kinked.

- Multiple part lines shall not be twisted around each other.
- The hook shall be brought over the load in such a manner to prevent swinging.
- During hoisting, care shall be taken that:
- There is no sudden acceleration or deceleration of the moving load.
- Load does not contact any obstructions.
- A derrick shall not be used for side loading except approved by Site Leader
- No hoisting, lowering, or swinging shall be done while anyone is on the load or hook.
- The operator should avoid carrying loads over people.
- Neither the load nor boom shall be lowered below the point where less than two full wraps of rope remain on their respective drums.
- When rotating a derrick, sudden starts and stops shall be avoided. Rotational speed shall be such that the load does not swing out beyond the radius at which it can be controlled.
- Boom and hoisting rope systems shall not be twisted.

Holding the Load

- The operator shall not be allowed to leave his position at the controls while the load is suspended; If the load must remain suspended for any considerable length of time, a dog, or pawl and ratchet, or other equivalent means, rather than the brake alone, shall be used to hold the load.
- Use of Winch Heads
- Ropes shall not be handled on a winch head without operator's knowledge
- While a winch head is being used, the operator shall be within convenient reach of the power unit control lever;
- Dogs, pawls, or other positive holding mechanism on the hoist shall be engaged. When not in use, the derrick boom shall:
 - Be laid down
 - Be secured to a stationary member, as nearly under the head as possible, by attachment of a sling to the load block; or
 - Be hoisted to a vertical position and secured to the mast.



17 - MECHANICAL EQUIPMENT AND GUARDS



Schedule

- Purpose
- Application
- Potential Hazards

Purpose

- To provide safe work practices for protection of personnel from rotating equipment and heat sources.

Application

- All plant/field activities and equipment.

Potential Hazards

- All rotating equipment, belts, pulleys, grinder, strophic effects (cause by rotating equipment specialist) etc., that present a hazard to personnel must be guarded. Any openings that could present a hazard to personnel must be guarded. All piping and equipment operated at a temperature that could cause personnel injury, must be insulated, clad, guarded or otherwise protected.

Procedures

- All mechanical equipment shall be installed and maintained only by qualified persons authorized to do so.
- Equipment shall be maintained in a safe condition at all times and any such
- Equipment found to be unsafe shall be isolated / immobilized until repaired.
- Protective clothing and equipment shall be worn as appropriate when Operating or maintaining mechanical equipment.
- All rotating, hot, cold and other moving parts shall be adequately guarded from accidental or other contact by personnel.
- Mechanical equipment shall be immobilized / isolated before any guards are removed and shall be rendered inoperative against start up by means of electrical or mechanical isolation.
- Any guards removed shall be refitted and adjusted before the Equipment is brought back into use. Whenever possible, adjustments shall only be made with the equipment immobilized or isolated
- Safety devices, including guards, governors, over speed trips, and other emergency shutdown devices fitted to machines shall not be removed or overridden.
- When work is carried out on moving machinery, a second person shall be in attendance at the control point to shut down in the event of emergency.
- Rotating / moving parts such as spindles, chucks, belts and gears may trap loose articles and clothing, or draughts caused by fans or rapidly rotating mechanical components may 'draw' clothing.
- Operators and supervisors shall ensure that no hazard results from loose clothing or long hair whilst operating machines.
- Gloves shall not be worn.
- Coveralls shall have cuffs that secure at the wrist.



17 - MECHANICAL EQUIPMENT AND GUARDS

Lathes / Machine Tools

- Only authorized and suitably trained persons shall operate machine tools. Protective clothing, particularly eye protection, shall be worn as appropriate to the job and machinery in use.

Machine safety guards shall be in position. In particular the following rules shall apply:

- Never use rags or waste near moving machinery
- Always use a chuck / cutter guard
- Never leave chuck keys / vice handles in position when not being used
- Mechanical stops or electrical cut-outs must not be removed or inhibited unless detailed on a work permit
- The machine should never be operated from the isolating switch, only from its own on / off switch
- Secure all loose items of clothing when operating machinery

The following notices should be on all lathes, milling and drilling machines:

- Authorized operators only wear eye protection.

Work Procedure for Use of Workshop Machines

- When machining work is carried out the chuck guard shall be used at all times. If a work piece is too large, or any other factor prohibits the use of the chuck guard, an exception to the above rule may be made, but only after the following procedure has been adhered to.
- The machining operation shall be discussed by the Maintenance Supervisor.
- If the decision is made by the Maintenance Supervisor to proceed with the work, a work permit shall be raised giving a full description of the machining operation and safety precautions to be taken.
- On receipt of the work permit and full compliance with the safety instructions detailed on that permit, the work may proceed.

Abrasive Wheels and Grinding

- No person shall mount, dress or use an abrasive wheel unless trained and authorized to do so. A register of authorized personnel shall be maintained by the Maintenance Supervisor. Eye protection shall be worn for all operations including fitting and dressing of abrasive wheels. Eye protection plus a face shield must be worn when using abrasives wheels.

Storage and handling of wheels:

- Wheels shall be handled and stored with care in accordance with the manufacturer's instruction. Knocking, dropping or sudden impact should be avoided. Wheels have a limited shelf life and should be stored in cool dry conditions in a position suited to the shape / size of the wheel.

Fitting and dressing of wheels:

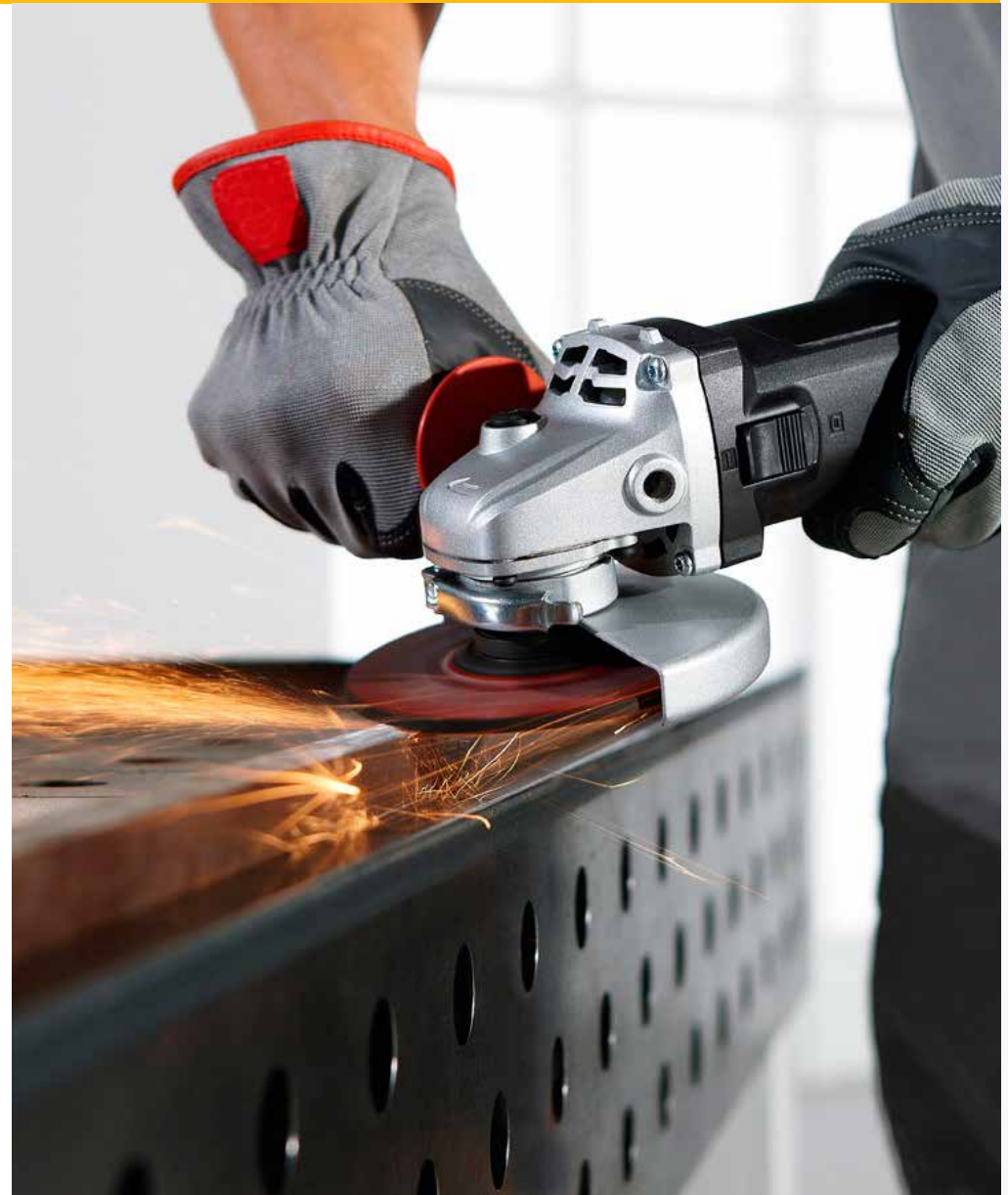
- The wheel shall comply with the maximum wheel size and speed marked on the machine
- Before fitting, a wheel shall be inspected to ensure it is sound after fitting, the wheel shall be run in and a balance check carried out before any grinding is attempted.
- Wheels shall only be dressed using the correct tool and procedure.



17 - MECHANICAL EQUIPMENT AND GUARDS

Use of Grinder

- Grinding wheels shall be fitted with adequate guards which are correctly adjusted
- The work rest shall be secure and adjusted to the minimum practical clearance and not more than 6mm between rest and wheel
- The wheel shall never be used at speeds greater than those marked on the wheel
- The grinder shall be marked to show maximum wheel size and speed
- Care should be taken to avoid sudden impact or knocking of the wheel as one of the great hazards with abrasive wheels is the disintegration of the wheel in service
- Care shall be taken at all times to ensure that no part of the body comes into contact with the wheel
- Normal pressure only shall be applied to the wheel. No undue force or pressure shall be used
- The side of a wheel shall not be used for grinding unless the wheel is designed for the purpose
- Only the correct wheel for the job shall be used. Soft material for which the wheel is not intended will clog a wheel, cause imbalance, hinder heat dissipation and may cause the wheel to disintegrate
- In the case of portable tools used for abrasive / grinding work, the additional requirements of section shall apply
- Hand held grinders shall not be used to grind small hand held items



18 - PERSONAL PROTECTIVE EQUIPMENT (PPE)

Definition

- PPE is a head to toe protective equipment which designed to create a barrier against workplace hazard.

Function

- To protect workers from working hazards, environment hazards, and reduce injury severity if accident occurred.

PPE in the Past

- People have used Personal Protective Equipment (PPE) for centuries to protect themselves while they work.
- Personal protective equipment today, as in the past, makes working safer and you more productive.
- Regulations/Guidance for "Personal Protective Equipment" OSHA 29 CFR 1910.132-138
- Briefly stated, this standard requires that employers must establish and administer an effective PPE program for employees and that employees be trained in proper use of PPE

Types of Hazard

Something with the potential to cause harm. They can include substances or machines, methods of work and other aspects of work organization

- Physical Hazard
- Chemical Hazard
- Biological Hazard
- Psychosocial Hazard

Potential Hazards in the Workplace

- Motion
- High temperatures
- Chemical exposures
- Harmful dust or light radiation

- Falling object or dropping objects
- Sharp objects
- Rolling or pinching objects
- Layout of workplace and location of co-workers
- Electrical hazards

Hierarchy of Hazard Controls

- Eliminate Hazard
- Substitute Hazard
- Engineering Controls
- Work Practice Controls (Administrative)
- PPE

Eliminating Hazard

- Improve design of equipment/processes
- Better methods of guarding
- Substituting safe or less hazardous substances for those presenting unacceptable levels of risk

Engineering Controls If

- The machine or work environment can be physically changed to prevent employee exposure to the potential hazard.

Examples:

- Initial design specifications
- Substitute less harmful material
- Change process
- Enclose process
- Isolate process
- Ventilation



18 - PERSONAL PROTECTIVE EQUIPMENT (PPE)

Work Practice Controls If

- Employees can be removed from exposure to the potential hazard by changing the way they do their jobs.

Examples:

- Use of wet methods to suppress dust
- Personal hygiene
- Housekeeping and maintenance
- Job rotation of workers
- Training

Personal Protective Equipment (PPE)

- Personal Protective Equipment (PPE) is the last level control
- PPE should be used only when other measures can't offer the protection you need
- PPE does not eliminate the hazards and only provides a barrier between the worker and the hazards

Minimum PPE Required by

- Hard Hat
- Safety glasses
- Safety Shoes
- Approved flame retardant coveralls

Potential Hazards

Eye & Face Protection

- Dusts, Powders, Fumes and Mists Operations such as grinding, chiseling, sanding, hammering, and spraying can create small airborne particles, particles that can injure your eyes

Flying Objects or Particles

- Operations such as grinding, chiseling, sanding, and hammering often create flying objects or particles that can damage your eyes

- Toxic Gases, Vapors, and Liquids
- Toxic chemicals in the form of gases, vapors, and liquids can damage your eyes. Always read the appropriate MSDS before working with any hazardous material.

Molten Metals

- Operations which involve or produce molten metal, if splashed, splattered, or dripped into the eyes, cause severe burns and tissue damage

Electrical Hazards

- Any time you work around electricity, there is the potential for arcs and sparks to occur.

Thermal and Radiation Hazards

- Operations such as welding, metal cutting, and working around furnaces can expose your eyes to heat, glare, ultraviolet, and infrared radiation

Lasers

- Laser beams present a new hazard in some workplaces

Personal Protection Equipment

Safety Glasses

Safety glasses are much stronger and more resistant to impact and heat than regular glasses. Most safety glasses are equipped with side shields that give you protection from hazards that may not be directly in front of you. Safety glasses should be Z-87 approved to meet OSHA regulations.

Goggles

Goggles give you more protection than safety glasses as they fit closer to your face. Goggles surround the eye area and give more protection in situations where might encounter splashing liquids, fumes, vapors, powders, dusts, and mists.



18 - PERSONAL PROTECTIVE EQUIPMENT (PPE)

Absorptive Lenses

A wide variety of absorptive lenses are available for use in safety glasses and goggles that offer additional protection if you must work where there is bright light or glare.

Face Shields

Face shields offer full face protection and are often used around operations which expose to molten metal, chemical splashes, or flying particles.

- NOTE: Always wear safety glasses or goggles when using a face shield. Face shields alone are NOT considered adequate eye protection.

Welding Helmets

Welding helmets provide both face and eye protection. Welding helmets use special absorptive lenses that filter the intense light and radiant energy.

- NOTE: safety glasses or goggles should be worn when using a welding helmet.

Respiratory Awareness Protection

Potential Hazards

- Dusts are formed whenever solid material is broken down into tiny particles. Dusts are often produced during sanding and grinding operations
- Vapors are substances that are created when a solid or liquid material evaporates. Materials that evaporate easily at room temperature include paint thinner, solvents, and gasoline.
- Fogs are vapors which have condensed into tiny airborne particles or droplets. An example of a hazardous fog would be an insect fogger used to rid industrial and residential areas of ticks and fleas.
- Mists & Sprays are very small droplets of liquid material suspended in the air. They are often produced by spray and coating operations.
- Gases are materials that are in the gaseous state at normal temperature (25oC) & pressure (1atm).
- Smoke is made up of small particles produced by the incomplete combustion of any material that has carbon in it. Smoke is often produced during

processes that require high heat or burning as part of the manufacturing process

- Fumes can occur whenever a metal, plastic, or polymer is subjected to a high heat during such processes as welding and soldering operations

Head Protection

Potential Hazards

- Impact to the Head: Falling or flying objects are a common cause of head injuries. Also, bumping head against fixed objects, such as exposed pipe or beams can cause head injuries.
- Electrical Shocks: Accidents involving electricity result in electrical shocks and burns.

Hard Hats

Class G (formerly class A) are designed to:

- Protect you from falling objects (general service)
- Protect you from electrical shocks up to 2,200 volts

Class E (formerly class B) are designed to:

- Protect you from falling objects (utility service)
- Protect you from electrical shocks up to 20,000 volts, (use extensively by electrical workers)

Class C Hard Hats: are designed to:

- Protect you from falling objects
- DO NOT protect you from electrical shocks
- DO NOT protect you from corrosive substances



18 - PERSONAL PROTECTIVE EQUIPMENT (PPE)

How Hard Hats Protect You:

Hard hats protect you by providing the following features:

- A rigid shell that resists and deflects blows to the head
- A suspension system inside the hat that acts as a shock absorber
- Some hats serve as an insulator against electrical shocks
- Shields your scalp, face, neck, and shoulders against splashes, spills, and drips.
- Some hard hats can be modified so you can add face shields, goggles, hoods, or hearing protection to them.

Wearing Hard Hats

- Hard hats shall meet ANSI Z89.1 Class G or E.
- Always wear your hard hat in areas where there are potential head hazards.
- Adjust the suspension inside your hard hat
- Inspect the shell for cracks, gouges, and dents and the suspension system for frayed or broken straps.
- Never paint, scratch or drill "air holes" in your hard hat. You may apply reflective plastic tape if you must work at night.
- Never carry personal belongings such as cigarettes, lighters, or pens in your hard hat.

Care and Maintenance

- Clean your hard hat at least once a month (or as needed) to remove oil, grease, chemicals, and sweat
- You can clean by soaking it in a solution of mild soap and hot water for 5-10 minutes. Rinse with clear water, wipe, and let air dry.
- Because sunlight and heat can damage the suspension of your hat, always store your hat in a clean, dry, and cool location.

Hearing Protection

Potential Hazards

Causes of sensory hearing loss are:

- Hereditary
- Damage to fetus
- Aging
- Noise
- Disease
- Injury
- Drugs

Note: Sensory hearing loss CANNOT be corrected medically or surgically. It is permanent.

Types of Hearing Protection Devices

There are many types of hearing protection devices available in the industry. It must be noted that they shall meet OSHA 29 CFR 1926.52; some devices in usage are:

- Foam and PVC Earplugs
- Earmuffs
- Canal Caps
- Earplugs & Canal Caps

The advantages of earplugs and canal caps are:

- Small & lightweight
- Comfortable in hot environments
- Easily used with other safety equipment.

The disadvantages of earplugs and canal caps are:

- May work loose and require occasional refitting
- Require specific fitting instructions
- Are frequently soiled.



18 - PERSONAL PROTECTIVE EQUIPMENT (PPE)

Earmuffs

The advantages of earmuffs are:

- Easy for your employer to supervise the wearing of this device.
- One size fits all.
- Fits better for longer periods of time.

The disadvantages of earmuffs are:

- May fit tight on your head.
- Uncomfortable in a warm environment.
- Problems occur when used with other equipment.

When Should You Wear a Hearing Protection Device?

- You should wear a hearing protection device whenever you are exposed to noise that is 85 decibels or greater for an 8-hour period of time.

Maintenance of Hearing Protection Devices

- When not using your foam earplugs, store them in clean, cool, dry place.
- If your foam earplugs become soiled, torn or stiff, discard them and ask your supervisor or safety manager for a new pair.

PVC Earplugs

- When not using your PVC earplugs, store them in a clean, cool, dry place.
- If your PVC earplugs become soiled, you can clean them with a mild solution of soap and water. Rinse, and then dry them with a soft towel.
- If your PVC earplugs become torn or brittle, discard them and ask your supervisor or safety manager for a new pair Earplugs

Earmuffs

- When not using your earmuffs, store them in a clean, cool, dry place.
- Always inspect your earmuffs for cracks around the foam cups. If your earmuffs are damaged, have them repaired immediately or ask your supervisor or safety manager for a new pair.

Hand Protection

Potential Hazards

Traumatic Injuries

- Tools and machines with sharp edges can cut your hands.
- Staples, screwdrivers, nails, chisels, and stiff wire can puncture your hands.
- Getting your hands caught in machinery can sprain, crush, or remove your hands and fingers.

Contact Injuries

- Coming into contact with caustic or toxic chemicals, biological substances, electrical sources, or extremely cold or hot objects can irritate or burn your hands.

WARNING: Toxic substances are poisonous substances that can be absorbed through your skin and enter your body.

Repetitive Motion Injuries

- Whenever you repeat the same hand movement over a long period of time, you run the risk of repetitive motion problems. Repetitive motion problems often appear as numbness or tingling sensation accompanied by pain and the loss of gripping power in your hands

Preventative Measures

- Housekeeping and Hygiene
- Poorly maintained machinery, tools, sloppy work areas, and cluttered aisles all contribute to hand injuries.
- Hand washing helps to remove germs and dirt from your hands. Clean hands are less susceptible to infection and other skin problems such as contact dermatitis.



18 - PERSONAL PROTECTIVE EQUIPMENT (PPE)

Gloves

- Metal mesh gloves resist sharp edges and prevent cuts.
- Leather gloves shield your hands from rough surfaces, spark and abrasive materials.
- Vinyl and neoprene gloves protect your hands against toxic chemicals.
- Rubber gloves protect you when working around electricity.
- Padded cloth gloves protect your hands from sharp edges, slivers, dirt, and vibration.
- Heat resistant/aluminized fabric gloves protect your hands from heat and flames.

Wearing and using Gloves

- Select gloves that fit.
- Some gloves may be chemical specified and have a life expectancy. Discard them after the recommended time has expired.
- Remove any rings, watches, or bracelets that might cut or tear your gloves.
- Wash your hands before and after wearing your gloves.
- Inspect your gloves before you use them.
- Look for holes and cracks that might leak.
- Replace gloves that are worn or torn.
- After working with chemicals, hold your gloved hands under running water to rinse away any chemicals or dirt before removing the gloves
- Wash cotton gloves as needed.
- Avoid borrowing gloves. Gloves are personal protective equipment.
- Store gloves right side out in a clean, cool, dry, ventilated area.
- Never wear gloves around powered rotating equipment – drills, lathes, etc.
- Barrier Creams - Water Repellent Creams are used to protect your hands from caustic chemicals.
- Solvent-Repellent Creams are used to protect your hands from solvents, oils, and other organic chemicals.
- Sunscreens protect your skin from the damaging effects of the sun.
- Vanishing Creams protect your skin against acids and make cleaning easier.

Warning:

- Never substitute a barrier cream when you should use gloves.
- Forearm Cuffs are used to protect your forearm.
- Thumb Guards and Finger Cots protect only your thumb or fingers.
- Mittens protect your hands while working around very cold or hot materials.
- Hand Pads are often found in kitchens and laboratories.
- Hand pads protect your hands while working around very hot materials.

Foot Protection

Potential Hazards

Impact Injuries

- At work, heavy objects can fall on or roll onto your feet. If you work around sharp objects, you can step on something sharp and puncture your foot.
- Injuries from Spills and Splashes
- Liquids such as acids, caustics, and molten metals can spill into your shoes and boots. These hazardous materials can cause chemical and heat burns.

Compression Injuries

- Heavy machinery, equipment, and other objects can roll over your feet. The result of these types of accidents is often broken or crushed bones.

Electrical Shocks

If not protected, your feet can suffer from frostbite if you must work in an extremely cold environment. Extreme heat, on the other hand, can blister and burn your feet. Finally, extreme moisture in your shoes or boots can lead to fungal infections. Some examples include:

- Accidents involving electricity can cause severe shocks and burns.
- Extremes in Cold, Heat, and Moisture



CHOOSING RIGHT FOOTWEAR FOR HEAVY WORK MINIMIZE FATAL INJURY



18 - PERSONAL PROTECTIVE EQUIPMENT (PPE)

Slipping

- Oil, water, soaps, wax, and other chemicals can cause you to slip and fall.

Housekeeping

- Poorly maintained machinery, tools, sloppy work areas, and cluttered aisles all contribute to foot injuries.

Preventative Measures

- Steel toe footwear protects your toes from falling objects and from being crushed.
- Metatarsal footwear has special guards that run from your ankle to your toes and protect your entire foot.
- Reinforced sole footwear has metal reinforcement that protects your foot from punctures.
- Latex/Rubber footwear resists chemicals and provides extra traction on slippery surfaces
- PVC footwear protects your feet against moisture and improves traction.
- Butyl footwear protects against most ketones, aldehydes, alcohols, acids, salts, and alkalis.
- Vinyl footwear resists solvents, acids, alkalis, salts, water, grease, and blood.
- Nitride footwear resists animal fats, oils, and chemicals.
- Electrostatic dissipating footwear conducts static electricity to floors that are grounded.
- Electrical hazard footwear is insulated with tough rubber to prevent shocks and burns from electricity.
- Disposable footwear includes shower slippers, clear polyethylene and nonwoven booties used in dust free work areas.

Wearing and using Safety Footwear

- Select and use the right safety footwear for the job you are going to be performing.
- Safety footwear should meet or exceed the standards set by ANSI (ANSI Z41-1991).
- Avoid safety footwear made of leather or cloth if you work around acids or caustics.
- Select safety footwear that fit.
- Inspect your safety footwear before you use them. Look for holes and cracks that might leak
- Replace safety footwear that are worn or torn.
- After working with chemicals, hose your safety footwear with water to rinse away any chemicals or dirt before removing your footwear.
- Avoid borrowing safety footwear. Safety footwear is Personal Protective Equipment.
- Store footwear in a clean, cool, dry, ventilated area.



19 - SCAFFOLDING SAFETY

Application

- General
- Scaffolding Terms
- Construction Practices Common to all Scaffolds
- Independent Tied Scaffolds
- Mobile Tower Scaffolds
- Truss Scaffolds
- Slung Scaffolds
- Drop Scaffolds
- Scaffolding to Tanks & Vessels
- System Scaffolding
- Special Scaffolds
- Portable Ladders

Potential Hazards

- Collapse of scaffolding
- Falls from scaffolds
- Falling objects off of scaffolds
- Electrical shock

Tube

- Scaffolding tubing is nominally 2" diameter pipe free from cracks, surface flaws and other defects. Any scaffold pipe which requires a high degree of maintenance such as wire brushing or scraping shall be replaced. The ends of scaffolding pipe should be cut square with the axis of the tube. Painting of scaffold tubes is not recommended and should be only for identification purposes

Fittings

- Fittings shall be examined before use in order to ensure all moving parts are free and well lubricated for easy and positive movement. Acid baths are an acceptable method of maintenance prior to oiling the moving parts of fittings. Heat should not be applied during maintenance. All fittings used shall be in accordance with British Standard 1139: Specifications for Couplers and Fittings for Use in Tubular Scaffolding.

Boards

- Scaffold boards shall meet the following specifications:
- 1-1/2" thick by 9-1/4" wide. Boards less than 1-1/2" thick are unacceptable. Boards greater than 1-1/2" thick shall not be wider than 9-1/4". All boards shall meet the requirements detailed in OSHA 1926. 451
- Boards with splits are unacceptable.
- Boards with knots larger than 2" are unacceptable.
- Grain shall run the length of the board.
- Warped boards are unacceptable.
- Board ends must be bound with hoop irons.
- Looking at the edge of a board, not more than half of the depth shall be knot wood.
- Boards shall not be painted or treated in any way that may conceal defects. Ends may be painted for identification purposes.
- Boards shall not have oil, grease or any other liquid spilled on them to where a fire or slipping hazard could be created. These boards shall be replaced.
- Notched boards shall be cut square and rebounded with hoop irons before use.
- Boards after use should be cleaned, stacked flat and raised above the ground height by cross battens for storage.



19 - SCAFFOLDING SAFETY

Housekeeping

- Scaffolding and the area around scaffolding is to be maintained in a clean and orderly fashion. Special attention is required to ensure that blasting material (grit) does not build up on scaffold boards.

Scaffolding Terms for Tubular Members

- Board Bearer (Intermediate Transom): A tube spanning across ledgers between transoms to support a work platform.
- Brace: A tube incorporated diagonally across two or more members in a scaffold and fixed to them in order to ensure stability.
- Guardrail (Also wrongly known as Handrail): A tube incorporated in a structure to prevent the fall of a person from a platform or access way. The tube is to be 36" - 45" above the deck.
- Handrail: Tube used on stairs before permanent handrails, banisters, etc., are fitted to prevent the fall of a person.
- Ledger: A tube spanning horizontally and tying a scaffold longitudinally. It may also act as a support for board bearers or transoms.
- Midrail: A tube incorporated in a structure midway between the guardrail and deck.
- Puncheon: A vertical tube supported otherwise than upon the ground or abase plate.
- Raker: An inclined load-bearing tube having a bearing on the ground or on an adjacent structure.
- Reveal Tie: A tube which is jacked or wedged between two opposing surfaces, e.g. a window opening (reveal), or to assist in tying a scaffold to a building or structural support beams.
- Standard (Upright): A tube used as a column or vertical in the construction of a scaffold, and transmitting a load to the ground deck or grating via a base plate and sole plate.
- Tie: A tube used to connect a scaffold to a rigid anchorage.
- Transom: A tube spanning across ledgers to tie a scaffold transversely, which may also support a working platform.

General Terms

- Base Plate: A metal plate with a spigot for distributing the load from a standard, rakes, or load bearing tube. Should be used in conjunction with a sole plate when used with a standard.
- Bay: The space between two adjacent standards along the face of a scaffold.
- Board: A softwood board used to provide access, a working platform, and protective components such as toe boards.
- Buttress: A well braced tubular structure erected against an existing scaffolding structure to strengthen it.
- Castor: A swivelling wheel with a locking device secured to the base of a vertical member for the purpose of mobilizing the scaffolding.
- Clip: Used to fix a board to a scaffold tube.
- Column Box-Tie: Two-way tie secured to a vertical column with tubes forming a 'box' around the column.
- Coupler: A component used to fix scaffold tubing together.
- Decking: A close boarded scaffold platform.
- Extension Bracket: A bracket secured to a standard to enable boards (usually two) to be placed between the inner standards of an independent scaffold and a wall or structure. Generally not used with tube and clip scaffolding, but for framework fitting.
- Hanging Wire: Wire rope used for suspending and anchoring slung scaffolds (minimum diameter 3/8 inches).
- Hoop Iron: Metal band fitted to the ends of board to prevent splitting.
- Junction: The intersection of a series of tubes.
- Ledger Bracing: Tubes secured diagonally between lifts, from ledger to ledger or standard to standard in order to ensure stability.
- Lift: The height from the ground or deck to the lowest ledger, or the vertical distance between two adjacent ledgers.
- Longitudinal Bracing (Face or Facade Bracing): Tubes secured diagonally across the face of a scaffold to ensure stability.
- Parallel Coupler: Short tube secured longitudinally across an end to end joint in tubing, to strengthen the joint. Not to be used instead of a joint or sleeve in uprights.



19 - SCAFFOLDING SAFETY

- Scaffold Lashing: 3/8" diameter rope or 1/4" wire used for lashing ladders, boards, etc. Not to be used for suspending or anchoring scaffolds, or for lifting operations.
- Sole Plate (Spreader): A timber or other member of adequate size and suitable quality used to distribute the load from the base plate over an area of ground, deck, or grating. To extend a maximum of 2' either side of the upright.
- Stiles: Vertical members of a ladder.
- System Scaffolding (Unit formwork, Kwikstage, or Frame Scaffolding): The term used to describe scaffolding is composed wholly or partly of purpose made frames or units.
- Toeboard (Kick Board): A board positioned along the edge of a platform in order to prevent per-sons, tools, and materials falling from the platform.
- Two-way Tie: A tie which prevents movement of the scaffolding both to and from the building or structure to which it is secured.
- Unit Beam (Truss): A purpose made lattice beam incorporated into a scaffold structure to form a bridge where openings are necessary. These can be bolted or jointed together.
- Work Stage (Staging): Purpose made decking for use on towers, trestles, roof trusses, or frames.
- Suspension Scaffold: A two-point suspension scaffold (swinging scaffold), the platform of which is supported by hangers at two points, is suspended from overhead supports so as to permit the raising or lowering of the platform to the desired working position by hoisting machines.
- Access
- Scaffold covers
- Incomplete scaffolding
- Inspections
- Base
- Intermediate lifts
- Working lift
- Miscellaneous
- Independent Tied Scaffolds
- An independent tied scaffold consists of a double row of standards connected together longitudinally with ledgers and with transoms at right angles to the ledger. Braces and ties are essential for stability. It is the most common form of access scaffolding and is divided into three groups.

Group Workload Use

- Light duty, Painting and cleaning, 15lbs/ft2
- General duty , Material being deposited on work platform, 37bs/ft2
- Heavy duty , Heavy material being deposited on work platform, 60 lbs/ft2



Construction Practices Common to all Scaffolds

- Protective equipment
- Use of safety Harness
- Foundations
- Standards
- Ledgers
- Decking
- Guardrails & Toe boards



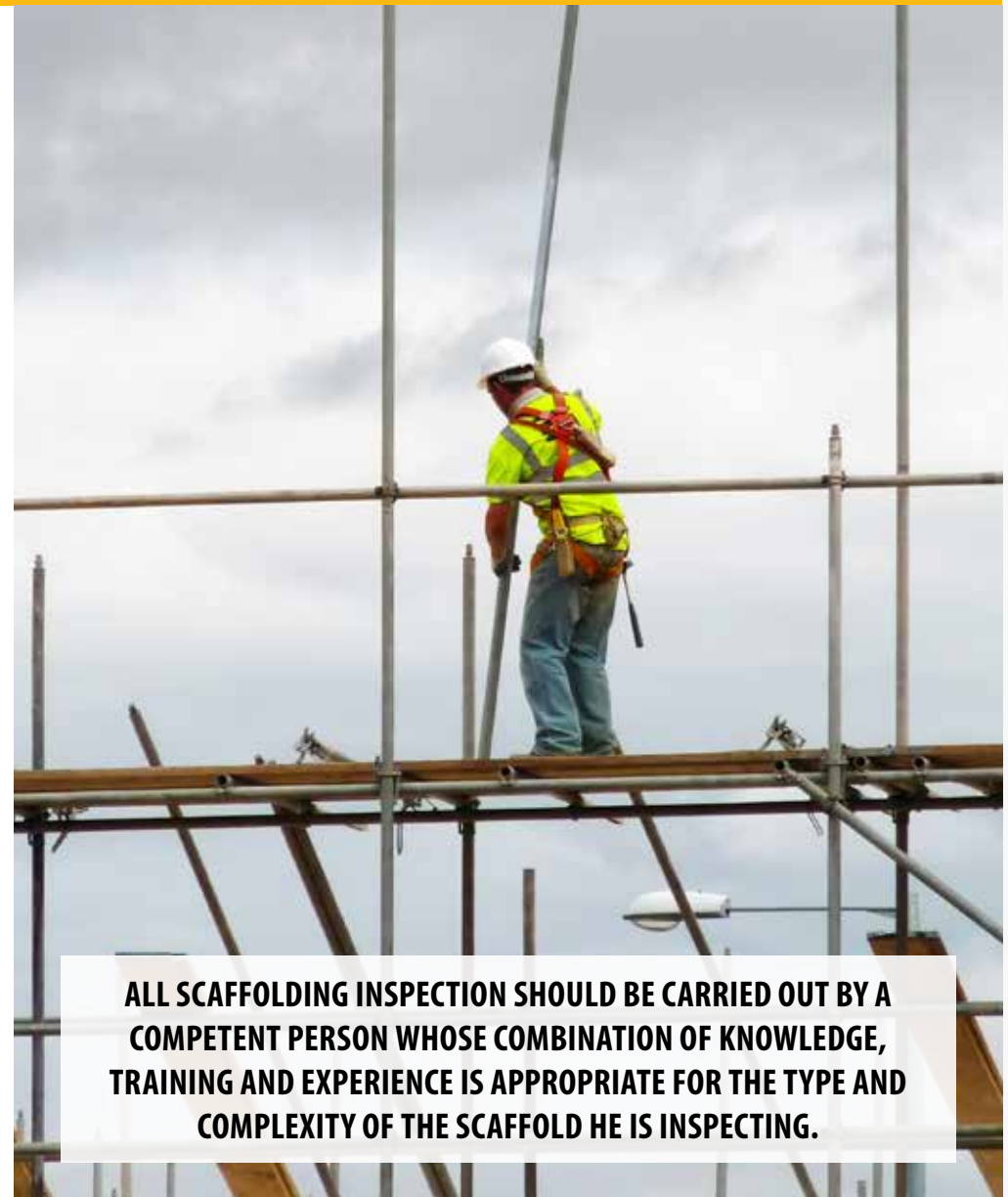
19 - SCAFFOLDING SAFETY

For General Requirements

- Mobile Tower Scaffolds
- Design, loading and dimensions
- For use internally
- For use externally
- Foundations
- Standards
- Ledgers and transoms
- Ties
- Guardrails and Mid rails
- Decking
- Access
- Operation
- Limitations
- Truss Scaffolds

A truss scaffold is cantilevered out from a building or structure and used where it is impractical to erect conventional scaffolding based upon the ground or another surface.

It is a form of light independent tied scaffold which is entirely dependent upon the building or structure for support and stability.



ALL SCAFFOLDING INSPECTION SHOULD BE CARRIED OUT BY A COMPETENT PERSON WHOSE COMBINATION OF KNOWLEDGE, TRAINING AND EXPERIENCE IS APPROPRIATE FOR THE TYPE AND COMPLEXITY OF THE SCAFFOLD HE IS INSPECTING.



20 - SMOKING

Introduction

- Medical evidence indicates tobacco smoke is a significant health hazard to both the smoker and the non-smoker, and we seek to provide a healthy workplace for all of our employees.
- To address these health concerns and promote a healthful working environment, has decided to ban smoking except in designated areas of all company owned/ concession /rented areas, not available to the general public where we conduct business, and all company-owned or leased vehicles.
- All persons on the premises () - including contract workers and visitors- are expected to comply with the smoking regulations detailed in this policy.
- We will impose no higher standard on the general public or on employees engaged in personal pursuits that is imposed by either the law or society.
- Therefore, Company owned/ leased/rented areas that are available to the general public or areas devoted primarily to employee recreation are excluded from area (s) which we can realistically declare smoke free.
- Smoking shall be permitted only in designated rooms and areas that are specifically designed to eliminate passive smoker; that is all air exhausted to the outside of the building and/or the smoke contaminated air is not re-circulated to the A/C unit.
- This includes owned/leased areas devoted primarily to employee recreation.
- A sign stating "Smoking Permitted" must be displayed inside building smoking areas.
- The absence of such sign means "No Smoking".

No Smoking Areas

- Any enclosed space within the buildings, except as noted in paragraph S7.1.2. For example all work areas, private offices and common areas.
- Any outside areas where fire or safety hazards exist and areas within 35 feet of hydrocarbon or chemical storage areas will be designated as no smoking areas.

Smoking Areas

- Smoking will only be permitted outside the Buildings at ground level and within open-air courtyards or in designated Building smoking rooms meeting the criteria of section S7.0 POLICY paragraph 4.
- Smoking shall be permitted in Company concession Cabins at the discretion of the occupants.
- Vehicles- no smoking
- Signs- appropriate signs will be displayed in all no smoking areas.



21 - WASTE MANAGEMENT

What is waste?

Materials that are no longer usable because of:

- decay
- corrosion
- leakage
- contamination
- expired
- broken
- spilled
- Materials that are the residue of an activity
- and/or production process

What is Waste Management?

- A comprehensive system that will enable to:
- Minimize waste generation.
- Ensure that all waste generated is disposed of in a safe, timely, efficient, cost effective and compliance with safety and all environment policies and regulations.

Policies & Regulations

Environmental Management:

- Environmental Impact Assessment Libyan Gov't Act no. XXXXXX on Environmental Management
- Those who damage or pollute the environment shall pay compensation to those whose rights have been violated
- Intentional violations are punishable by up to 10-15 years in prison and/or Rp 500MM-750MM
- Businesses which propose business activities must study the significant environmental impacts of the proposed activity as part of the decision making process

- An analysis of environmental impacts constitutes part of the feasibility study of business plans and/or plans of activities

Hazardous & toxic waste (B3 waste) definition :

- any waste containing dangerous and/or toxic material which may damage the living environment and/or endanger human health

Treatment of B3 Waste aim:

- To eliminate or reduce the hazardous and toxic properties of B3 waste so as not endanger human health and the environment
- Every person and corporation is prohibited to dispose of B3 waste directly into water, soil and air
- Enterprises carrying out collecting, transportation or processing shall acquire the following permits
- Producer, collector, transporter and processor of B3 waste shall be responsible for emergency response and pollution of the environment as a result of emission or spilling of B3 waste
- Drilling mud and cuttings and oil bottom sludge is categorized as B3 waste
- Characteristic test of B3 waste consist of : explosive, burnable, reactive, toxic, infectious and corrosive

Waste Minimization:

Effort to minimize waste generation are made from stages:

- Planning
- Procurement
- Handling and Transportation
- Storage
- Usage



21 - WASTE MANAGEMENT

Planning:

- Evaluate waste minimization options, by reviewing opportunities for:
- Reduce or eliminate waste, volume or toxicity
- Recycling
- Reclaiming
- Other treatment
- Take a pilot test for evaluation
- Plan and encourage lifecycle assessment in the development of every process to limit waste generation, discharges and emissions

Procurement Process:

- Carefully estimate the amount of required materials to avoid excess material
- Minimize the variety of materials ordered
- Minimize surplus inventory and potential waste
- Negotiate with suppliers to return the excess materials and/or containers
- Select low-volume, low toxicity products whenever feasible

Handling and Transportation:

Proper handling and transportation are required to minimize waste generation, include physical check on:

- Delivery Condition
- Proper Packaging
- Marking and Labeling
- MSDS
- Proper Loading / Unloading
- Transportation Method

Storage:

- Proper storage method
- Pre-check on delivery conditions (quality, quantity, packaging, MSDS, documentation)
- Preparation of space layout design

- Foundation and containment
- Proper materials placement
- Regular physical check and inventory stock

Usage:

Use up all materials on location to minimize waste generation, includes:

- Optimization of consumption
- Sufficient material usage control
- Proper tools and proper handling
- Reuse in other location

Waste Identification and Handling:

- Categorization
- Volume estimation
- Segregation
- Temporary storage and handling
- Administration
- Documentation
- Waste code
- Performance metrics

Waste Categorization

- Hazardous waste
- Non-Hazardous waste:
 - Non-Hazardous industrial and oil & gas field
 - Domestic waste

What makes a waste Hazardous?

- Declared by its generator
- Included in the hazardous wastes list in Libyan Government legislation
XXXXXXX
- Contains one or more of following features:



21 - WASTE MANAGEMENT

- Explosive
- Flammable
- Reactive
- Toxic
- Infectious
- Corrosive
- Any mixtures of hazardous wastes with other materials
- Unknown waste

Typical Hazardous wastes in 's Operations

- Used battery
- Used lubricant
- Used chemical (corrosive / poison)
- Sludge
- Drilling mud
- Drilling cutting

How to handle unknown waste materials?

- Treat As Hazardous Waste
- Employees At The Point Where The Container Originated Are Responsible For Identifying The Material
- Waste Which Cannot Be Identified Must Be Sent To A Lab To Be Analyzed
- Mixture Of Hazardous And Non-Hazardous Wastes In One Container Results In Whole Container Being Classified As Hazardous Waste
- Non-Hazardous Industrial and Oil & Gas field waste
- Typically Includes ONLY Wastes Associated With Industrial Processes
- Cannot Be Sent To A Municipal Waste Landfill
- Should Not Be Mixed With Domestic Waste Such As Garbage Or Construction Waste
- Example Of Non-Hazardous Industrial Waste :
 - Assort. Used Filters (Exclude Oil/Fuel filters)
 - Used abrasive materials, rust, etc.

- Sump sludge
- Unused non-hazardous chemicals and supplies

Examples of Non-Hazardous Oilfield waste

- Produced sand and other well solids
- Excess cement slurries and cement cutting

Domestic Waste

- Normal, everyday garbage / waste generated at cafeterias (galleys), office facilities, and living quarters
- Packaging wastes
- Volume Estimation on Site: To make proper and accurate calculation on further transportation, budgeting, storing and other requirements

Types of waste based on volume measurement

- Liquid: Measured by volume
- Semi Liquid: Measured by volume or weight
- Solid: Measured by weight
- Waste Segregation
- Proper waste segregation at the point of origin is critical to the whole waste management chain
- Each location is responsible for organizing space and containers, and develop a system to assure proper waste segregation
- All waste shall be segregated according to their general physical and chemical characteristics
- Prior to disposal, waste must be segregated into:
 - Hazardous waste: Solid, Liquid and Gas.
 - Non – hazardous waste >> Solid: bio-degradable- wood/paper- glass - metal - rubber/plastic- liquid

Temporary Storage & Handling Hazardous Waste:

- stored max 90 days from 1st drop



21 - WASTE MANAGEMENT

Stored in proper warehouse:

- Flood-free
- Geologically stable
- Accommodate waste characteristic and procedure to mitigate pollution
- Stored separately from other waste
- Placed in 15-55 gallon (60-220 liter) polypropylene (plastic) or drums exclusively for a specific hazardous waste
- Temporary Storage & Handling

Non-hazardous Industrial Oil & Gas Field Waste:

- Should be collected, accumulated and stored in separate containers
- Temporary Storage & Handling
- Domestic waste:
 - Accumulated in trash baskets or bins used exclusively for this category
 - Regular trash containers equipped with lids or nets to avoid waste escape during transportation or storage

Waste Administration:

- All waste materials must be properly identified, with marking and labels
- All hazardous waste packages must have valid MSDS in its shipment
- All undefined waste will be returned to its point of origin for identification

Documentation

- Waste Manifest required for its shipment shall include:
- Type, characteristic, quantity and date of 1st drop of waste in the container
- Type, characteristic, quantity and time of delivery
- Name of transporter

Waste Code:

- Shall comply with Libyan Regulation no. XXXXXXXXXXXX

Performance Metrics

Metrics which will apply should consider performance measures, such as:

- Percentage of waste shipments from offshore to shore base which conform to waste segregation guidelines
- Reduction in waste volumes generated
- Percentage of wastes recycled
- Number of waste management inspections
- Percentage of employees undergoing waste management training

Waste Disposal

Waste cannot be legally disposed of unless it has been handled according to the following procedures:

- Approval
- Packaging
- Handling and Transportation Method
- Disposal Alternatives

Approval

- EGA approved transportation and disposal facility for Hazardous Waste.

Packaging

Must be packed properly to prevent any leakage/ damage during transportation and handling. Types of packaging usually used are:

- Metal: marine portable tanks, cutting boxes
- Plastic: plastic drums, trash bags, rice sacks
- Wood: wooden boxes, plywood boxes



21 - WASTE MANAGEMENT

Hazardous Waste Packaging

- Good quality containers, constructed to prevent leaking during shipment or due to changes in temperature, humidity, pressure or vibration
- Packaging (include closures) must be resistant to chemical or other actions of wastes
- Materials of container must not contain substances may react with the contents
- Handling and Transportation Method
- Waste handling is series of operations including the collecting, segregating, recording, packaging, labeling and transporting of waste

Hazardous Waste Labeling

- As soon as the FIRST DROP of hazardous waste is placed in a container, a label should be attached to the container
- The Hazardous Waste Label should include the following:
- Waste name and type of hazard
- Accumulation date (date of 1st drop of waste)

Waste Transportation

- Process of moving waste from the generator to the collector and/or to the processor, including to the place of final disposal using transportation facilities
- Waste is to be transported by land and/or sea

Transporting Hazardous Waste

- Performed by an EGA approved hazardous waste Transportation Company
- Accompanied with complete waste manifest
- Shall be carried out by special transportation facilities, which meet both transportation requirements and procedures as stipulated in government regulations

Disposal Alternatives

- Re-use
- Recycle / recovery
- Return to vendor / manufacturer
- Donate to Local Authority
- Dispose at Waste Management Company
- Send to Junk Dealer / Reclaimer
- On-shore disposal (burn, landfill)
- Return to Vendor or Manufacturer:
 - Unused chemical
 - Bulk containers
 - Used batteries
 - Unused paints
 - drums
 - Use contract provisions wherever possible to require takeback
- Dispose at Waste Management Company :
 - Disposal of Hazardous waste
 - Disposal must be at facilities permitted under Libyan Government Regulation XXXXXXXXXX
 - All requirements on packing, labeling, transporting, etc should be fulfilled
- Send to Junk Dealer (Reclaimer) :
 - Steel scrap
 - Junk drums
 - Plastic scrap
 - Soft drink cans
 - Glass





Our Projects



When it comes to Operations Management, then we are always focused on details.

FOLLOWING PICTURES SHOW SOME OF OUR COMPLETED PROJECTS



10" Trunk Line at 5J Area Waha Oilfield Project



138kV Defa / Faregh High Transmission Line Project



138kV Defa / Faregh High Transmission Line Project



10" Trunk Line at 5J Area Waha Oilfield Project

LIST OF OUR COMPLETED PROJECTS

Since its establishment has successfully completed more than 40 projects...



Since its establishment, Jabel Oilfield Services focused on providing Quality-Oriented technical but economical solutions to the industry. This unique approach has helped us completing broad range of oilfield projects with complete customer's satisfaction.

#	Description
1	Construct new work shop (Hanger) at UMM EL FOROD plant / Bida field.
2	Construct handrail at EL_DOR / Bida field.
3	Construct handrail at EL-KATLA Bida field.
4	Construct handrail at EL-HAMADA field.
5	Replacement of Oil Line for Well nos. C51-, C137-, C1- at Sarir field.
6	Construct 6" dia. water lines at plant No. 679-6112-686 for water injection.
7	Carried out water drainage at EL-NAFORA.
8	Cleaning of set of plants at SARIR.
9	Replacement of water-de saltier lines at MESLA.
10	Construct Oil Well 4" dia. at plant No. 9-6-1.
11	Field cutting of some parts of trees.

#	Description
12	Carried out sand cleaning inside the Accommodation area at EL-NAFORA.
13	Construct handrail for football sports ground.
14	Carry out sand cleaning on wells at MAJD field.
15	Construct sand walls at MAJD field.
16	Construct steel handrail at MAJD field.
17	Construct Mobile Accom. Building roof together with Electrical / Water & Sewage connection.
18	Construct water tanks inside Accommodation area at MAJD field.
19	Carried out complete grounding for swimming pool.
20	Construct Aluminum doors at MESLA filed.
21	Modification of Toilets at Guest House.
22	Construct 500 pipe supports (RAKS) at SARIR field.



FOLLOWING PICTURES SHOW SOME OF OUR COMPLETED PROJECTS



Sidra Marine Project



Tubrok Project



Tubrok Project



Sidra Marine Project

LIST OF OUR COMPLETED PROJECTS



#	Description
23	Construct new pipe connection, 3» dia. For water supply & connected to wells no. 151,152, at SARIR field.
24	Construct cable concrete channel at SARIR field.
25	Maintenance of Nine Accommodation building at SARIR field.
26	Construct handrail for Accommodation & Industrial Zones at SARIR field.
27	Supply & install Generator, 500 KVA for SARIR Refinery.
28	Construct refrigerator at MAJD field
29	Construct steel handrail for Accommodation area at MAJD field.
30	Replacement of 6" oil line at HH43 MESLA field.
31	Replacement of Loop extension on wells no. HH 43, HH11, HH.

#	Description
32	Manpower Supply and Service Contracts with Waha Oil Company (R-124).
33	Construct set of Concrete foundation at MESLA field.
34	Construct 300 pieces of pipe supports at MESLA field.
35	Execution of MESLA field Airstrip.
36	Supply and construction of 4 Hangers – NAFORA Oil Field and Tobruk
37	Construct wall at MESLA field.
38	High line project - Waha oil company south Defa \ Faregh
39	Contract number 35\2010 Harouge Oil Operations
40	10" trunk line at 5 J area (Waha field) waha oil company



SOME OF OUR MAIN CLIENTS

Our clients trust us because we deliver principled performance, efficiency and unrivaled value.

We thank our clients for placing their trust in JOS. For details list of our clients you can contact us anytime by visiting our office or through email or phone call.



Sirte Oil Company
www.soc.com.ly



Harouge Oil Operations
www.harouge.com



AGOCO
www.tpao.gov.tr



ENI Oil Company
www.eni.com





JABEL OIL SERVICES

Tripoli Branch

Tel: +218 21-483-0594

Tel: +218 21-484-3226

Fax: +218-21-361-3798

Address: Seyahiya, Near British Council, Tripoli - Libya.

Benghazi Branch

Fax: +218-61-224-1340

Address: Benghazi, Libya.

Jabel Oil Services is an established organization in Libya. We are focused on improving Libyan economy by signing and completing core projects in the industry while creating attractive jobs for talented workforce.