INDUSTRIAL SKILLS FRAMEWORK

Competencies, Certifications & Training Needs for Core & in-Demand Skillsets

OIL GAS & ENERGY

1st Edition, January 2020

HRDF

PETRONAS

In Collaboration With

MOGSC

MICCI

Suruhanjaya Tenaga

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Cautionary Statement

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Images are for illustrative purposes only.

Content

Acknowledgement

Special thanks to Corporate Projects, Group Procurement, PETRONAS Project Delivery and Technology, being the key driver to the Sectorial Training Committee in bringing the industry players together towards the production of this guidebook, an industry initiative by PETRONAS to enhance the competitiveness of the OGSE industry;

To Subject Matter Experts (SMEs) from PETRONAS technical disciplines and Institut Teknologi Petroleum PETRONAS (INSTEP);
To industry representatives from Malaysian Oil & Gas Services Council (MOGSC) members, participating OGSE vendors and Tenaga Nasional Berhad (TNB);

To relevant authorities being Suruhanjaya Tenaga (ST), Construction Industry Development Board (CIDB) Jabatan Pembangunan Kemahiran (JPK), Department of Occupational Safety & Health (DOSH); and

To Industrial Skills Framework Unit under Human Resource Development Fund (HRDF) for the valuable contribution in making this possible.

Special Mention

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Dr. Dasline Sinta (SME: Instrumentation & Control)
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Rosdzaman bin Dato' Mohd Yusup (SME: IECex)
Tuan Haji Ismail Abu Bakar (SME: Piping & Static Equipment)
Khairul Azman Yasin (SME: HR and Talent)

FOREWORD

Dear Partners,

First of all, I would like to thank the committee members for entrusting me to be the Chairman of Sectorial Training Committee (STC) for Oil, Gas & Energy (OGE). It is indeed a humbling new experience for me.

I am pleased to present our inaugural Industrial Skills Framework (ISF) for OGE, as our debut product within only 5 months since the formation of the STC. This is only possible with strong support and commitment given by our active members.

This document is a reflection of our industry coming together to address the needs of our biggest asset in the country: our TALENTS.

It aims to cover the core and in-demand skillsets in OGE where in this first edition, the focus is given to areas of Maintenance, Turnaround and Projects for Onshore Facilities and Downstream Plants.

We will continue to expand to more areas of Oil, Gas and Energy in the future such as Upstream, whilst keeping it up-to-date.

In meeting such an ambitious target, I humbly request for an active participation from the industry, to capitalise on this platform, to reach out to your constituency in the STC, and to provide feedback and inputs so that ISF continues to grow.

As a national reference, the ISF will bring together parties in the ecosystem towards OGE talent needs. It is a sure way to make trainings and certifications demand-driven; and to ensure that rightful parties can make targeted solutions to allocate funding in meeting industry talent development needs.

Special thanks to MOGSC for the amazing job in coordinating workshops to gather industry inputs and compiled them into this document. And lastly, my gratitude to HRDF as the key sponsor in creating this platform.

Thank you.

M Iskandar Bakeri
Chairman,
HRDF Sectorial Training Committee,
Oil, Gas & Energy
January 2020

Purpose of this Document

Industrial Skills Framework (ISF) aims to outline desirable competencies of talents in the Oil, Gas & Energy industry.

It provides insights on skills requirements and career pathways, as well as the required trainings and certifications, to meet talent development needs of the industry.

It complements existing references such as the National Occupational Skills Standard (NOSS) and Malaysian Qualifications Framework (MQF).

Target Audience

EMPLOYEES & INDIVIDUALS IN OGE SECTOR

Enable employees and individuals to make informed decisions on training/ certifications towards lifelong learnings and career development.

EMPLOYERS OF OGE COMPANIES/ INDUSTRY PLAYERS

Enable industry players to design progressive talent development plans and as a channel to voice their training and certifications needs.

TRAINING PROVIDERS AND HRDF

Enable a demand-driven training ecosystem to suit the needs of the industry in providing in-demand OGE training programmes.

Supplementary Key References

PETRONAS Activity Outlook
A 3-year outlook on key activities in Oil & Gas and overall industry outlook, published yearly.

The 2019 edition features " Malaysia OGSE Talent Landscape" on core skillets and forecasted talent demand in the sector.

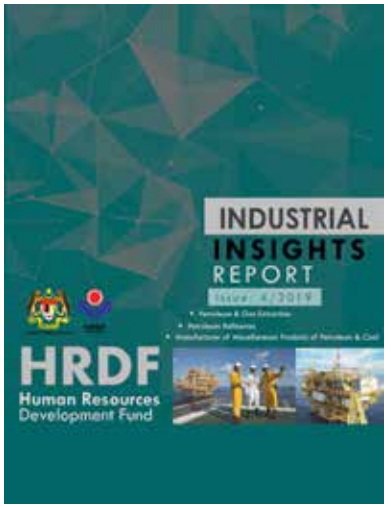
The recently published 2020 edition provides updated industry overview and direction.

Future edition to this Industrial Skills Framework will include Upstream and Energy, where the skills requirements will be reviewed in tandem with changes to the industry direction as featured in PETRONAS Activity Outlook.

PETRONAS ACTIVITY OUTLOOK 2019-2021

PETRONAS ACTIVITY OUTLOOK 2020-2022

HRDF References and Publications



HRDF as the main sponsor has a good list of training schemes and grants for the industry players listed on their main website.

In addition, relevant HRDF publications such as Industrial Insights Reports related to trainings in Oil & Gas can provide latest information to employers and training providers on insights into areas of focus for trainings in OGE.

HRDF References

HRDF Reports

Malaysia Petroleum Management (MPM) Regulator & Enabler

MPM is entrusted to manage the nation's petroleum resources in order to protect and maximise long-term value to PETRONAS and the nation.

KEY PLAYERS IN OIL & GAS

PETRONAS as Regulator & Enabler to manage the petroleum resources of the nation.

Petroleum Development Act 1974

1 PETRONAS

2 PETROLEUM ARRANGEMENT CONTRACTORS

Other PAC players
PETRONAS Contractors / Investors / Operators

Other international oil companies in Malaysia including PETRONAS Carigali

MICCI

Note: MICCI through MICCI-PPSC is the key industry associations representing Malaysian PACs

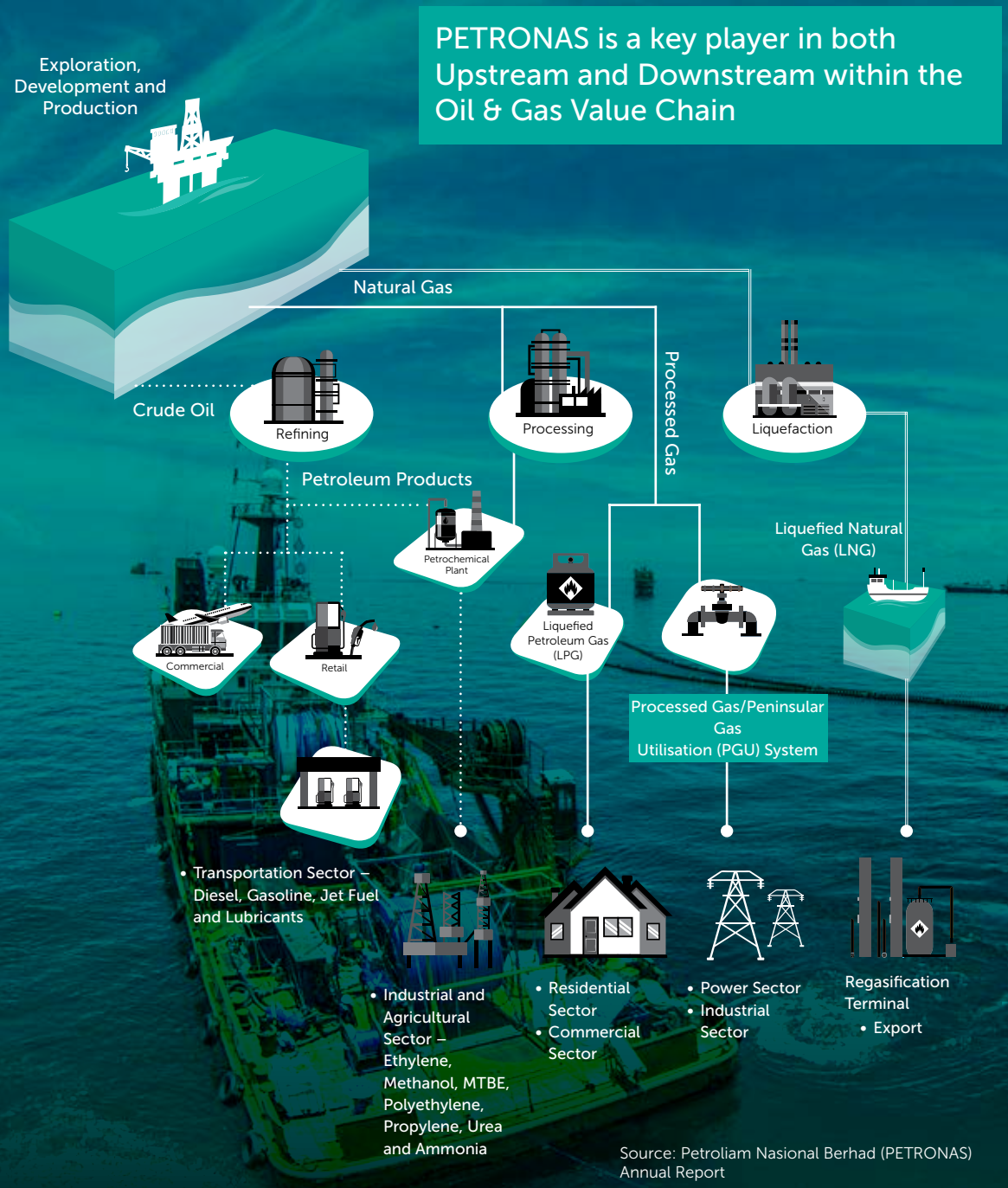
3 VENDORS

Vendors
Supplier / Service Providers

MOGSC
MALAYSIAN OIL & GAS SERVICES COUNCIL

Note: MOGSC is one of the industry associations representing service providers. Other examples of relevant industry associations include MOSVA, MOCA, etc.

Source: Petroliam Nasional Berhad (PETRONAS)



Upstream

Exploration — Developing resource potential and building up commercial reserves

Development — Field development and construction including supporting infrastructure

Production — Drilling and production of hydrocarbons

Decommissioning & Abandonment — An activity to restore a previously producing site to a safe and environmentally stable condition

Downstream

Refining — Processing crude oil and condensates into useful petroleum products

Petrochemicals — Processing oil and gas into products from which other chemicals are derived

Midstream Gas — Gas Liquefaction
Natural Gas Processing
LNG (Liquefied Natural Gas)
LPG (Liquefied Petroleum Gas)
PGU (Peninsular Gas Utilization System)

Marketing & Retail — Trading and marketing of crude oil and petroleum products to individuals and commercial customers.

Selling and marketing of fuel and non-fuel products and providing one-stop convenience centers at service stations.

Key Policy Maker and Regulatory

Ministry Of Energy, Technology, Science, Environment & Climate Change

Suruhanjaya Tenaga

- Promote competition
- Protect interests of consumers
- Issue licenses
- Tariff regulation

Power Generation

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Independent Power Producers

Conventional

- e.g. Conventional Thermal (Coal), Combined Cycle Gas Turbine (CCGT), Open Cycle Gas Turbine (OCGT), Conventional Thermal (Gas), Hydroelectric

Renewables

- e.g. Solar PV, Biomass, Biogas, Mini Hydro

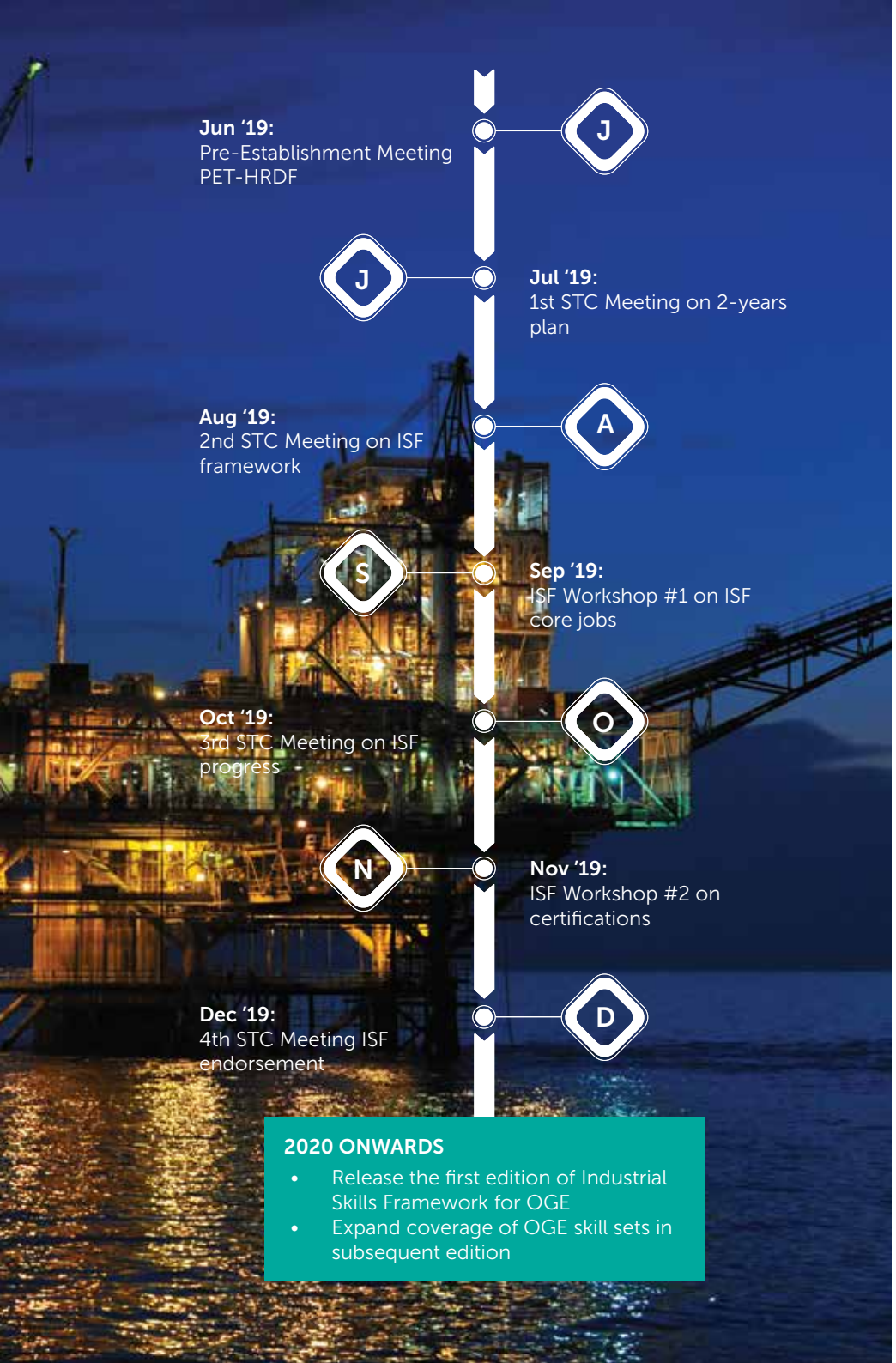
PETRONAS

Petronas has presence in solar in Malaysia via:

- Voltage Renewables Sdn. Bhd. Solar Farm in Gebeng Kuantan (10MW)
- PETRONAS Power Sdn. Bhd. via new rooftop development

Consumers (distribution by TNB)

Source: Tenaga Nasional Berhad (TNB) Handbook, Suruhanjaya Tenaga & PETRONAS



Founding Principle

The Sectorial Training Committee (STC) for Oil, Gas and Energy (OGE) was established in July 2019 to bring together key stakeholders in the Oil, Gas & Energy landscape for talent development. It serves as a platform for the industry to identify and address training needs through collaboration; creating a demand-driven training environment in our relentless efforts to ensure human capital advancement.

Key Members and Deliverables

- It is important for the STC to be well-represented by the key parties within the OGE spectrum. The STC comprises representatives from the following stakeholders:
- **PETRONAS**: Chairman to the STC
- **MOGSC**: An industry association of Malaysia Oil & Gas Services Companies, covering both Downstream & Upstream
- **MICCI-PPSC**: Malaysian International Chamber Of Commerce & Industry (Petroleum Producers Standing Committee), an industry association for PACs (Petroleum Arrangement Contractors) in the upstream sector of Oil & Gas
- **MESTECC**: Ministry of Energy, Science, Technology, Environment & Climate Change of Malaysia
- **Suruhanjaya Tenaga**: Regulator for the Malaysian energy sector
- **TNB**: Tenaga Nasional Berhad, key player for energy producer in Malaysia
- **DOSH**: Department of Occupational Safety & Health of Malaysia
- The STC has been an active platform with dynamic engagements; completion of the first edition of Industrial Skills Framework for OGE marked the key deliverable for the year 2019.

Introduction to **Industrial Skills Framework for Oil, Gas & Energy**

Content of this Document

This first edition focuses on core and in-demand skill sets to meet the growth in Downstream activities of Oil & Gas, mainly in the areas of Maintenance, Turnaround and Projects for Onshore Facilities and Downstream Plants. Similarly, these skill sets are also relevant and required in other areas such as Upstream Oil & Gas. Hence, subsequent edition will target to cover other key activities in Oil, Gas & Energy sectors. It consists two key sections:

- Skills & Competencies Description
- List of Certifications & Training Needs

Preparing Skills & Competencies in Future Editions:

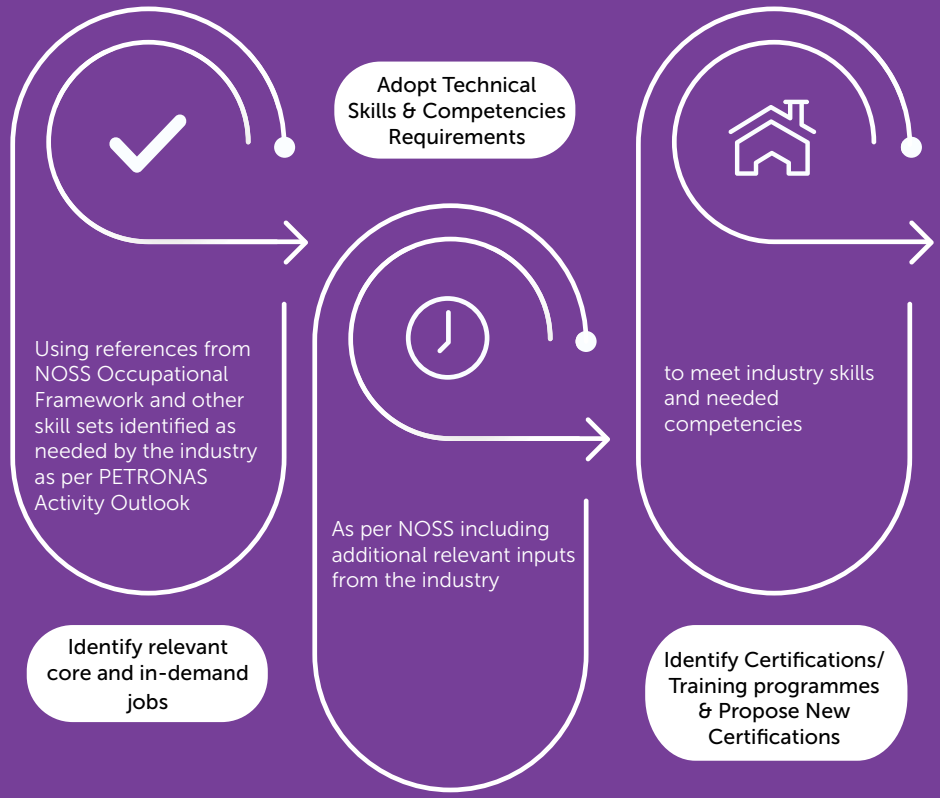
Changes in global mega trend, technology, values and culture, and new ways of working, require every organisation to adopt and adapt fast to remain competitive and relevant.

These published skillsets are relevant to meet current needs, but require constant updating to urgently address the acceleration in technological advancement at workplaces.

Typical Career Progression will start from Level 1, moving upwards to Level 5 as per below example in Section B:

Methodology

The Industrial Skills Framework seeks to adopt and align competency requirements according to the National Occupational Skills Standards (NOSS) and industry inputs to ensure human capital relevancy to Oil, Gas & Energy players with the larger ecosystem.



ISF Development Workshops with Industry

Comprehensive inputs from the industry were gathered through workshops conducted in September and November 2019 for the development of the Industrial Skills Framework.

Participants of the workshops were key stakeholders in the industry from identified Oil & Gas companies, industry experts and practitioners, government agencies including CIDB, DOSH, JPK, relevant training providers and members of the STC such as MOGSC, Suruhanjaya Tenaga, TNB, PETRONAS and HRDF.

Skills & Description of Competencies

Onshore Facilities & Downstream Plant Skillsets in Maintenance Activities

Skillsets:

- Structure Welding
- Pipe Welding
- Pipe Fitting
- Rigging & Slinging
- Scaffolding
- Insulation
- Blasting & Painting
- Valve Overhauling
- Rotating Equipment
- Flange Management
- Radiographic Testing
- Dye Penetrant Testing
- Electrical
- Field Instrumentation
- Safeguarding System (SGS) Instrumentation
- Distributed Control System (DCS) Instrumentation
- Quality Measuring Instruments (QMI)

SKILL AREA	Onshore Facilities & Downstream Plants Skillsets in Maintenance Activities				
SKILLSET	**STRUCTURE WELDING**				
SKILL DESCRIPTION	Structural welding works describe the activities of jointing two pieces of plates or structural materials. The job involves various welding technique to fuse plates and structural materials such as beams, columns, rods and other fixtures to form a complete or part of structure or metalwork. *[NOTE: Highlighted columns are for job in-demand. Personnel career development will start from the lowest level, moving upwards]*				
COMPETENCY DESCRIPTION	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
	Welding Assistant	**Structural Welder**	**Structural Welding Foreman**	**Welding Supervisor**	**Welding Superintendent**

KNOWLEDGE REQUIREMENT		• Types of constructiondrawings which include:
		  • Plan view, Cross-sectional drawings;
		  • Shop drawings.
		• Types of welding techniques and its application which include:
		  • Shielded Metal Arc Welding (SMAW)
		  • Gas Metal Arc Welding (GMAW)
		  • Flux Core Arc Welding (FCAW)
		  • Submerged Arc Welding (SAW)
		  • Shop drawings.
		• Safe work practices which include:
		  • Working at Height
		  • Working in Confined Space
		  • Housekeeping at Workplace
			• Welding Practice documents which include:
			  • Welding Qualification Test (WQT)
			  • Welding Procedure Specification (WPS)
			  • Procedure Qualification Record (PQR)
			• Types of welding defects which include:
			  • Cracks
			  • Undercutting
			  • Slag/flux inclusion
			• Types of welding Non-Destructive Testing (NDT) which includes:
			  • Dye Penetrant Test (DPT)
			  • Radiography Test (RT)
			  • Magnetic Particle Test (MPT)
			  • Ultrasonic Test (UT)
			• Hazard risk assessment and documentation which includes:
			  • Job Safety Analysis (JSA)
			  • Permit to Work (PTW)
			  • Toolbox Briefing
			• Technical writing skill.
			• People management skill.
			• Interpersonal skill.
			• Communications skill.
			• 3R concept; Reduce, Reuse, Recycle.		

COMPETENCY DESCRIPTION	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
	Welding Assistant	**Structural Welder**	**Structural Welding Foreman**	**Welding Supervisor**	**Welding Superintendent**

ABILITIES REQUIREMENT		• Calibrate welding tools and equipment as per parameters listed in the Welding Procedure Specification (WPS).
		• Secure and fasten structural components using clamps, braces, jacks and bolt straps.
		• Carry out post-welding treatment of structures by cleaning, buffing and polishing finished workpieces.
		• Utilise manual and mechanical processes to weld in various positions.
		• Carry out fillet, tack and full penetration welding on structural joints.
		• Perform welding techniques which include:
		  • Shielded Metal Arc Welding (SMAW)
		  • Gas Metal Arc Welding (GMAW)
		  • Flux Core Arc Welding (FCAW)
		  • Submerged Arc Welding (SAW)
		  • Gas Tungsten Arc Welding (GTAW)
		  • ISO 4063 Welding and Allied Processes
		• Perform chipping and cleaning between weld layers.
		• Perform initial visual inspection after completion of welds.
		• Adhere to safety procedures.
		• Respond to unsafe conditions at work place.
			• Interpret Welding Procedure Specification (WPS).
			• Analyse structural drawings to layout the framework of a structure for joint design and configuration.
			• Inspect and evaluate welds to ensure they are free of defects and conform to specifications.
			• Conduct estimates to determine the bill of quantities of materials required for a welding project.
			• Employ appropriate welding methods in completing structural fabrications.
			• Coordinate Non-Destructive Testing (NDT) and Destructive Test (DT) for finished weld-joints.
			• Identify and initiate repair of weld defects.
			• Prepare work schedule and manpower assignment.
			• Perform supervisory function on welding and cutting techniques which includes:
			  • Shielded Metal Arc Welding (SMAW)
			  • Gas Metal Arc Welding (GMAW)
			  • Gas Tungsten Arc Welding (GTAW)
			  • Flux Core Arc Welding (FCAW)
			  • Submerged Arc Welding (SAW)
			  • ISO 4063 Welding and Allied Processes
			• Perform audit on welders in accordance with standard operating procedure.
			• Monitor adherence to safety procedures.
			• Conscious of unsafe conditions surrounding the work place.
			• Concern about sustainability and wastage.		

SKILL AREA	Onshore Facilities & Downstream Plants Skillsets in Maintenance Activities				
SKILLSET	**PIPE WELDING**				
SKILL DESCRIPTION	Pipe welding works describe the activities of jointing two pieces of pipes or pipe fittings. The job involves various welding technique to fuse pipes and fittings such as elbows, reducers, flanges, valves and other fittings materials to form a complete or spool piece of piping or pipeline. *[NOTE: Highlighted columns are for job in-demand. Personnel career development will start from the lowest level, moving upwards]*				
COMPETENCY DESCRIPTION	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
	Welding Assistant	**Piping Welder**	**Piping Welding Foreman**	**Welding Supervisor**	**Welding Superintendent**

KNOWLEDGE REQUIREMENT		• Types of construction drawings which include:
		  • Piping plan
		  • Isometric drawings
		• Types of welding techniques and its application which include:
		  • Shielded Metal Arc Welding (SMAW)
		  • Gas Metal Arc Welding (GMAW)
		  • Flux Core Arc Welding (FCAW)
		  • Submerged Arc Welding (SAW)
		  • Isometric drawings
		• Safe work practices which include:
		  • Working at Height
		  • Working in Confined Space
		  • Housekeeping at Workplace
			• Welding Practice document which includes:
			  • Welding Qualification Test (WQT)
			  • Welding Procedure Specification (WPS)
			  • Procedure Qualification Record (PQR)
			• Knowledge on Welding Map.
			• Types of welding defects which include:
			  • Cracks
			  • Undercutting
			  • Slag/flux inclusion
			• Types of welding Non-Destructive Testing (NDT) which includes:
			  • Dye Penetrant Test (DPT)
			  • Radiography Test (RT)
			  • Magnetic Particle Test (MPT)
			  • Ultrasonic Test (UT)
			• Hazard risk assessment and documentation which include:
			  • Job Safety Analysis (JSA)
			  • Permit to Work (PTW)
			  • Toolbox Briefing
			• Technical writing skill.
			• People management skill.
			• Interpersonal skill.
			• Communications skill.
			• 3R concept; Reduce, Reuse, Recycle.		

COMPETENCY DESCRIPTION	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
	Welding Assistant	**Piping Welder**	**Piping Welding Foreman**	**Welding Supervisor**	**Welding Superintendent**

ABILITIES REQUIREMENT		• Interpret Welding Map.
		• Calibrate welding tools and equipment as per parameters listed in the Welding Procedure Specification (WPS).
		• Secure and fasten pipes & fittings components using clamps, braces, jacks and bolt straps.
		• Carry out post-welding treatment of pipes & fittings by cleaning, buffing and polishing finished workpieces.
		• Utilise manual and mechanical processes to weld in various positions.
		• Perform current adjustment prior to welding.
		• Carry out fillet, tack and full penetration welding on pipes & fittings joints.
		• Perform welding techniques which include:
		  • Shielded Metal Arc Welding (SMAW)
		  • Gas Tungsten Arc Welding (GTAW)
		  • Gas Metal Arc Welding (GMAW)
		  • Flux Core Arc Welding (FCAW)
		  • Submerged Arc Welding (SAW)
		• Perform chipping and cleaning between weld layers.
		• Perform initial visual inspection after completion of welds.
		• Adhere to safety procedures. Respond to unsafe conditions at work place.
			Prepare Welding Map.
			• Interpret Welding Procedure Specification (WPS).
			• Analyse piping drawings to lay-out the pipes & fittings for joint design and configuration.
			• Inspect and evaluate welds to ensure they are free of defects and conform to specifications.
			• Conduct estimates to determine the bill of quantities of materials required for a welding project.
			• Employ appropriate welding methods in completing pipes & fittings fabrications.
			• Coordinate Non-Destructive Testing (NDT) and Destructive Test (DT) for finished weld-joints.
			• Identify and initiate repair of weld defects.
			• Prepare work schedule and manpower assignment.
			• Perform supervisory function on welding and cutting techniques which includes:
			  • Shielded Metal Arc Welding (SMAW)
			  • Gas Tungsten Arc Welding (GTAW)
			  • Gas Metal Arc Welding (GMAW)
			  • Flux Core Arc Welding (FCAW)
			  • Submerged Arc Welding (SAW)
			• Perform audit on welders in accordance with standard operating procedure.
			• Monitor adherence to safety procedures.
			• Conscious of unsafe conditions surrounding the work place.
			• Concern about sustainability and wastage.		

SKILL AREA	Onshore Facilities & Downstream Plants Skillsets in Maintenance Activities				
SKILLSET	**PIPE FITTING**				
SKILL DESCRIPTION	Pipe fitting works describe the activities of fabrication of piping and pipelines. The job involves cutting, grinding, fit-up and assembly of pipes and fittings such as elbows, reducers, flanges and other fittings materials to form a complete or spool piece of piping or pipeline. *[NOTE: Highlighted columns are for job in-demand. Personnel career development will start from the lowest level, moving upwards]*				
COMPETENCY DESCRIPTION	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
	Pipe Fitting Assistant	**Pipe Fitter**	**Pipe Fitting Foreman**	**Pipe Fitting Supervisor**	**Pipe Fitting Superintendent**

KNOWLEDGE REQUIREMENT		• Types of construction drawings which include:
		  • Piping plan
		  • Isometric drawings
		• Safe work practices which include:
		  • Working at Height
		  • Working in Confined Space
		  • Housekeeping at Workplace
			• Knowledge on Welding Map.
			• Hazard risk assessment and documentation which include:
			  • Job Safety Analysis (JSA)
			  • Permit to Work (PTW)
			  • Toolbox Briefing
			• Technical writing skill.
			• People management skill.
			• Interpersonal skill.
			• Communications skill.
			• 3R concept; Reduce, Reuse, Recycle.		

ABILITIES REQUIREMENT		• Measure and marking of pipes for cutting. • Perform cutting, threading or hammering pipe to specification. • Perform oxy-cutting of pipe spools. • Perform grinding and fit-up of piping joints for welding. • Assemble pipes, tube fittings and related equipment. • Perform chipping & cleaning for finished work piece. • Perform fitting and assembly of work piece. • Adhere to safety procedures. • Respond to unsafe conditions at work place.	• Interpret piping drawings. • Perform calculation for dimensional work. • Inspect and test installed piping system. • Plan piping system layout, installation or repair works. • Prepare written materials (e.g. work orders, requisitions, drawings, sketches, etc.). • Perform complex fit-up and assembly. • Prepare work schedule and manpower assignment. • Monitor adherence to safety procedures. • Conscious of unsafe conditions surrounding the work place. • Concern about sustainability and wastage.		

SKILL AREA	Onshore Facilities & Downstream Plants Skillsets in Maintenance Activities				
SKILLSET	**RIGGING & SLINGING**				
SKILL DESCRIPTION	Rigging and slinging works describe the activities of lifting and moving heavy loads with ropes, webbing, chains and other mechanical devices such as winches, chain-blocks, pull-lifts and other hoisting equipment. The job involves handling of lifting tools such as eye-bolts, shackles, wire slings and other mechanical lifting devices to perform a safe rigging and slinging works. *[NOTE: Highlighted columns are for job in-demand. Personnel career development will start from the lowest level, moving upwards]*				
COMPETENCY DESCRIPTION	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
	Rigging Assistant	**Rigger**	**Rigging Foreman**	**Rigging Supervisor**	**Rigging Superintendent**

KNOWLEDGE REQUIREMENT		• Types of lifting and slinging equipment which include:
		  • Eye-bolts and shackles.
		  • Webbing, wire ropes, chain slings.
		• Winches, chain blocks/ pull-lifts.
		• Safe work practices which include:
		  • Working at Height
		  • Working in Confined Space
		  • Housekeeping at Workplace
			• Types of lifting equipment defects which include:
			  • Pitting and corrosion.
			  • Necking.
			• Weight estimation technique.
			• Technical writing skill.
			• People management skill.
			• Interpersonal skill.
			• Communications skill.
			• 3R concept; Reduce, Reuse, Recycle.
				• Lifting plan and procedures.
				• Load test procedures and requirements which include:
				  • Dead weight load
				  • Safe Working Load (SWL)
				• Technical writing skill.
				• People management skill.
				• Interpersonal skill.
				• Communication skill.
				• 3R concept; Reduce, Reuse, Recycle.	

ABILITIES REQUIREMENT		• Inspect and maintain slinging equipment and accessories.
		• Carry out periodic load-test of listing equipment.
		• Analyse objects to be lifted, shape and weight distribution.
		• Select suitable slinging equipment.
		• Record use of lifting and slinging equipment.
			• Verify lifting equipment fit for use.
			• Organise load test.
			• Interpret lifting procedure.
			• Develop lifting equipment inspection schedule.
			• Develop lifting equipment inspection checklist.
			• Carry out inspection of minor lifting equipment.
			• Prepare work schedule and manpower assignment.
			• Monitor adherence to safety procedures.
			• Conscious of unsafe conditions surrounding the work place.
			• Concern about sustainability and wastage.
				• Prepare lifting procedure.
				• Prepare lifting plan.
				• Supervise rigging operation.
				• Carry out inspection of major lifting equipment.
				• Verify inspection of equipment.
				• Coordinate DOSH visit for PMA equipment.
				• Hazard risk assessment and documentation which include:
				  • Job Safety Analysis (JSA)
				  • Permit to Work (PTW)
				  • Toolbox Briefing
				• Prepare work schedule and manpower assignment.	

SKILL AREA	Onshore Facilities & Downstream Plants Skillsets in Maintenance Activities				
SKILLSET	**RIGGING & SLINGING**				
SKILL DESCRIPTION	Rigging and slinging works describe the activities of lifting and moving heavy loads with ropes, webbing, chains and other lifting mechanism. The job involves operating of mobile cranes of different safe working load capacity to lift and sling the lifted object across an area of lift radius. *[NOTE: Highlighted columns are for job in-demand. Personnel career development will start from the lowest level, moving upwards]*				
COMPETENCY DESCRIPTION	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
	No Level	**Signalman**	**Crane Operator**	**No Level**	**No Level**

KNOWLEDGE REQUIREMENT			• Knowledge on estimation of load weight and centre of gravity (CG).
			• Crane Load Chart
			  • boom length versus lifting capacity
			  • with/ without outrigger fully extended
			• Safe work practices which include:
			  • soft-ground
			  • underground cables or piping
			  • swing activities over human or equipment		

ABILITIES REQUIREMENT			• Monitor stability of crane and extension of outrigger on hard, flat surface.
			• Determine no cables or piping underground of crane/ outrigger parking.
			• Observe balance of lifting load.
			• Inspect hoisting equipment such as sling-wire, shackles, crane wire-rope, hook, etc.
			• Determine swing area is safe which includes:
			  • cordoned area of lift
			  • no trespasser during lift
			  • guide-rope to control sway
			  • lifting over equipment/ piping
			• Carry out lifting of objects; ensure safe operation of lift.
			• Plan swing direction of load.
			• Interpret lifting signal by signalman or foreman.		

SKILL AREA	Onshore Facilities & Downstream Plants Skillsets in Maintenance Activities				
SKILLSET	**SCAFFOLDING**				
SKILL DESCRIPTION	*Scaffolding works describe the activities of erecting and dismantling of tubular-type or modular-type structure for falsework, access and/or working platform.* *[NOTE: Highlighted columns are for job in-demand. Personnel career development will start from the lowest level, moving upwards]*				
COMPETENCY DESCRIPTION	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
	Level-1 Scaffolder	**Level-2 Scaffolder**	**Scaffolding Supervisor**	**Scaffolding Inspector**	**No Level**

KNOWLEDGE REQUIREMENT	• Basic components of metal scaffolding which include:
	  • tubes
	  • couplers
	  • boards/decking
	• Fall protection.
	• Safe work practices which include:
	  • Working at Height
	  • Working in Confined Space
	  • Housekeeping at Workplace
		• Types of scaffolding which include:
		  • single scaffolding
		  • double scaffolding
		  • tubular scaffolding
		  • cantilever scaffolding
		• Fall protection.
		• Safe work practices which include:
		  • Working at Height
		  • Working in Confined Space
		  • Housekeeping at Workplace
			• Scaffold Standards:
			  • MS 1462 Metal Scaffolding
			  • BS 1139 Metal Scaffolding
			• Basic types of scaffolds which include:
			  • supported scaffolds
			  • suspended scaffolds
			• Technical writing skill.
			• People management skill.
			• Interpersonal skill.
			• Communications skill.
			• 3R concept; Reduce, Reuse, Recycle.
				• Scaffold Standards:
				  • MS 1462 Metal Scaffolding
				  • BS 1139 Metal Scaffolding
				• Technical writing skill.
				• People management skill.
				• Interpersonal skill.
				• Communications skill.
				• 3R concept; Reduce, Reuse, Recycle.	

ABILITIES REQUIREMENT	• Check fit-for-use of scaffolding materials and accessories.
	• Interpret scaffolding drawing.
	• Construct scaffolding which includes:
	  • static tower scaffolding
	  • independent scaffolding
	  • bird cage scaffolding
	  • putlog scaffolding
	  • trestle scaffolding
	• Maintain scaffolding fittings.
	• Adhere to safety procedures.
		• Check fit-for-use of scaffolding materials and accessories.
		• Interpret scaffolding drawing.
		• Construct scaffolding which includes:
		  • mobile tower scaffolding
		  • cantilever scaffolding
		  • suspended scaffolding
		  • truss-out (spur) scaffolding
		  • truck access/ gantry scaffolding
		  • slung scaffolding
		  • shoring system
		  • false work
		  • flying shore
		  • raking shore
		• Maintain scaffolding fittings.
		• Respond to unsafe conditions at work place.
			• Conduct hazard risk assessment which includes:
			  • Job Method Statement (JMS)
			  • Job Safety Analysis (JSA)
			  • Permit to Work (PTW)
			  • Toolbox Briefing
			• Perform work planning and scheduling which includes:
			  • materials and consumables planning
			  • tools and equipment optimisation
			  • manpower assignment
				• Interpret use of scaffolding which includes:
				  • falsework
				  • access platform
				  • working platform
				• Inspect scaffolding fit-for-use.
				• Assess scaffolding fitness periodically; after strong wind, heavy downpour, modifications made, expiry date.
				• Monitor adherence to safety procedures.
				• Conscious of unsafe conditions surrounding the work place.
				• Concern about sustainability and wastage.	

SKILL AREA	Onshore Facilities & Downstream Plants Skillsets in Maintenance Activities				
SKILLSET	**INSULATION**				
SKILL DESCRIPTION	Insulation works describe the activities of applying insulation materials to piping or process equipment or other mechanical systems in order to help control and maintain temperature; such as application of rockwool or calcium silicate and aluminium sheet protection for weather or contact damage. *[NOTE: Highlighted columns are for job in-demand. Personnel career development will start from the lowest level, moving upwards]*				
COMPETENCY DESCRIPTION	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
	Insulation Assistant	**Insulator**	**Insulation Foreman**	**Insulation Supervisor**	**Insulation Superintendent**

KNOWLEDGE REQUIREMENT		• Basic principal of insulation.
		• Safe work practices which include:
		  • Working at Height
		  • Working in Confined Space
		  • Housekeeping at Workplace
			• Types of cold insulation.
			• Types of hot insulation which include:
			  • rockwool
			  • calcium silicate
			• Technical writing skill.
			• People management skill.
			• Interpersonal skill.
			• Communications skill.
			• 3R concept; Reduce, Reuse, Recycle.		

ABILITIES REQUIREMENT		• Interpret structural and piping drawings.
		• Measure and cut insulation materials for covering surface.
		• Carry out pre-forming of insulation cladding.
		• Perform insulation installation on piping, equipment or structures.
		• Remove and seal-off old insulation.
		• Adhere to safety procedures.
		• Respond to unsafe conditions at work place.
			• Calculate requirements of insulation materials which include:
			  • rockwool material
			  • cladding material
			• Prepare work schedule and manpower assignment.
			• Monitor adherence to safety procedures.
			• Conscious of unsafe conditions surrounding the work place.
			• Concern about sustainability and wastage.
			• Hazard risk assessment and documentation which include:
			  • Job Safety Analysis (JSA)
			  • Permit to Work (PTW)
			  • Toolbox Briefing
			• Prepare work schedule and manpower assignment.		

SKILL AREA	Onshore Facilities & Downstream Plants Skillsets in Maintenance Activities				
SKILLSET	**BLASTING & PAINTING**				
SKILL DESCRIPTION	Blasting & painting works describe the activities of surfaces preparation and coating application of structures or piping or equipment to a defined standard for protection of the surface from rust or corrosion damage due to exposure to the environment. *[NOTE: Highlighted columns are for job in-demand. Personnel career development will start from the lowest level, moving upwards]*				
COMPETENCY DESCRIPTION	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
	Blaster Assistant	**Blaster**	**Blasting & Painting Inspector**	**Blasting & Painting Supervisor**	**Blasting & Painting Superintendent**

KNOWLEDGE REQUIREMENT		• Blasting specifications in oil & gas industry.
		• Blasting application technique: its advantages and limitations.
		• Safe work practices which include:
		  • Working at Height
		  • Working in Confined Space
		  • Housekeeping at Workplace
			• Basic blasting & painting controlled parameters which include:
			  • temperature/ humidity/ wind
			• Technical writing skill.
			• People management skill.
			• Interpersonal skill.
			• Communications skill.
			• 3R concept; Reduce, Reuse, Recycle.		

ABILITIES REQUIREMENT		• Interpret blasting requirements.
		• Carry out preparation which includes:
		  • surface preparation
		  • protection works such as masking/ patching
		• Maintain blasting tools.
		• Perform blasting work which includes:
		  • St. 2/ St. 3
		  • Sa 3/ Sa 2/ Sa 1/ Sa 2.5
		• Adhere to safety procedures.
		• Respond to unsafe conditions at work place.
			• Interpret Client requirements.
			• Inspect blasting works which include:
			  • type of blasting materials
			  • surface finish
			• Inspect painting preparation which includes:
			  • work piece surface temperature
			  • environment humidity
			• Inspect painting works which include:
			  • paint specification
			  • painting application
			  • painting thickness
			• Monitor adherence to safety procedures.
			• Conscious of unsafe conditions surrounding the work place.
			• Concern about sustainability and wastage.		

SKILL AREA	Onshore Facilities & Downstream Plants Skillsets in Maintenance Activities				
SKILLSET	**BLASTING & PAINTING**				
SKILL DESCRIPTION	Blasting & painting works describe the activities of surfaces preparation and coating application of structures or piping or equipment to a defined standard for protection of the surface from rust or corrosion damage due to exposure to the environment. *[NOTE: Highlighted columns are for job in-demand. Personnel career development will start from the lowest level, moving upwards]*				
COMPETENCY DESCRIPTION	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
	Painting Assistant	**Painter**	**Blasting & Painting Inspector**	**Blasting & Painting Supervisor**	**Blasting & Painting Superintendent**

KNOWLEDGE REQUIREMENT		• Coating application specifications in oil & gas industry.
		• Painting application technique: its advantages and limitations.
		• Safe work practices which include:
		  • Working at Height
		  • Working in Confined Space
		  • Housekeeping at Workplace
			• Basic blasting & painting controlled parameters which include:
			  • temperature/ humidity/ wind
			• Technical writing skill.
			• People management skill.
			• Interpersonal skill.
			• Communications skill.
			• 3R concept; Reduce, Reuse, Recycle.		

ABILITIES REQUIREMENT		• Interpret painting requirements.
		• Mix paint additives as per specification.
		• Carry out preparation which includes:
		  • surface preparation
		  • protection works such as masking/ patching
		• Maintain painting tools.
		• Apply painting technique which includes:
		  • brush
		  • roller
		  • airless spray
		• Perform painting work which includes:
		  • base coat
		  • intermediate coat
		  • finishing coat
		• Adhere to safety procedures.
		• Respond to unsafe conditions at work place.
			• Interpret Client requirements.
			• Inspect blasting works which include:
			  • type of blasting materials
			  • surface finish
			• Inspect painting preparation which includes:
			  • work piece surface temperature
			  • environment humidity
			• Inspect painting works which include:
			  • paint specification
			  • painting application
			  • painting thickness
			• Monitor adherence to safety procedures.
			• Conscious of unsafe conditions surrounding the work place.
			• Concern about sustainability and wastage.		

SKILL AREA	Onshore Facilities & Downstream Plants Skillsets in Maintenance Activities				
SKILLSET	**VALVE OVERHAULING**				
SKILL DESCRIPTION	Valve overhauling works describe the activities of restoration of valve through repair or replace of components to restore it to the intended function. It involves dismantling, components cleaning/inspection/replacement and re-assemble and testing of the valve. *[NOTE: Highlighted columns are for job in-demand. Personnel career development will start from the lowest level, moving upwards]*				
COMPETENCY DESCRIPTION	**LEVEL 1**	**LEVEL 2**	**LEVEL 3**	**LEVEL 4**	**LEVEL 5**
	Valve Overhauling Assistant	**Valve Overhauling Technician**	**Valve Overhauling Technician Foreman**	**Valve Overhauling Technician Supervisor**	**Valve Overhauling Technician Superintendent**

KNOWLEDGE REQUIREMENT		• Types of valve design and application which include:
		  • gate/ globe/ ball/ butterfly
		  • non-return valve (NRV)
		  • pressure safety valve (PSV)
		  • etc.
		• PSV bench test and calibration procedures.
		• Valve servicing procedures as per Quality Control and ASME codes & standards.
		• Safe work practices which include:
		  • Working at Height
		  • Working in Confined Space
		  • Housekeeping at Workplace			

ABILITIES REQUIREMENT		• Interpret notification of valves defect.
		• Perform troubleshooting of valves.
		• Perform disassembly/ repair/ assembly of valves which include:
		  • gate/ globe/ ball/ butterfly
		  • non-return valve (NRV)
		  • pressure safety valve (PSV)
		  • etc.
		• Perform testing and calibration of valves.
		• Prepare valve repair report.
		• Prepare PSV calibration certificate.
		• Adhere to safety procedures.
		• Respond to unsafe conditions at work place.			

SKILL AREA	Onshore Facilities & Downstream Plants Skillsets in Maintenance Activities				
SKILLSET	**ROTATING EQUIPMENT**				
SKILL DESCRIPTION	Rotating Equipment maintenance works describe the activities of overhauling, components cleaning/ repair/ replace, restore and testing the rotating equipment to its intended function. Reinstallation of the rotating equipment also involves alignment works and piping tie-ins. *[NOTE: Highlighted columns are for job in-demand. Personnel career development will start from the lowest level, moving upwards]*				
COMPETENCY DESCRIPTION	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
	Rotating Equipment Assistant	**Rotating Equipment Technician**	**Rotating Equipment Foreman**	**Rotating Equipment Supervisor**	**Rotating Equipment Superintendent**

KNOWLEDGE REQUIREMENT		• Types and application of pumps which include:
		  • centrifugal (horizontal)
		  • centrifugal (vertical)
		  • plunger
		  • screw
		  • diaphragm
		• Overhaul procedures of single-stage centrifugal pump.
		• Overhaul procedures of positive displacement pump which include:
		  • plunger
		  • diaphragm
		• Safe work practices which include:
		  • Working at Height
		  • Working in Confined Space
		  • Housekeeping at Workplace
			• Interpret pump defect notification.
			• Basic troubleshooting of pumps defect which includes:
			  • low/ no flow rate
			  • high/ low/ no pumping pressure
			  • high/ low running temperature
			• Overhaul procedures of multi-stage centrifugal pump.
			• Overhaul procedures of positive displacement pump which includes:
			  • screw
			  • rotary
			• Technical writing skill.
			• People management skill.
			• Interpersonal skill.
			• Communications skill.
			• 3R concept; Reduce, Reuse, Recycle.		

ABILITIES REQUIREMENT		• Interpret notification of compressor/ pump defect.
		• Carry out preventive maintenance types of compressor which includes:
		  • centrifugal
		  • reciprocating
		  • screw
		• Carry out preventive maintenance types of pumps which includes:
		  • centrifugal (horizontal)
		  • centrifugal (vertical)
		  • plunger
		  • screw
		  • diaphragm
			• Interpret scope of rotating equipment defect.
			• Prepare work schedule and manpower assignment.
			• Perform basic troubleshooting of rotating equipment which includes:
			  • compressors
			  • pumps
			  • mixers
			  • blowers
			  • air fin fans
			• Carry out overhauling of air compressor.		

COMPETENCY DESCRIPTION	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
	Rotating Equipment Assistant	**Rotating Equipment Technician**	**Rotating Equipment Foreman**	**Rotating Equipment Supervisor**	**Rotating Equipment Superintendent**

ABILITIES (Continue)		• Carry out overhauling of single-stage centrifugal pump.
		• Carry out servicing of positive displacement pumps which includes:
		  • plunger
		  • screw
		  • diaphragm
		• Perform pump/motor alignment.
		• Prepare compressor/pump overhauling report.
		• Adhere to safety procedures.
		• Respond to unsafe conditions at work place.
			• Carry out overhauling of multi-stage centrifugal pump.
			• Perform pump/motor or pump/steam turbine alignment.
			• Prepare rotating equipment overhauling report.
			• Monitor adherence to safety procedures.
			• Conscious onof unsafe conditions surrounding the work place.
			• Concern about sustainability and wastage.
			• Hazard risk assessment and documentation which includes:
			  • Job Safety Analysis (JSA)
			  • Permit to Work (PTW)
			  • Toolbox Briefing
			• Prepare work schedule and manpower assignment.		

SKILL AREA	Onshore Facilities & Downstream Plants Skillsets in Maintenance Activities				
SKILLSET	**ROTATING EQUIPMENT**				
SKILL DESCRIPTION	Rotating Equipment conditioned-based monitoring works describe the activities of online or offline monitoring of the equipment to provide early warning of the equipment deterioration for quick intervention to prevent extensive damage or unplanned breakdown of the equipment. *[NOTE: Highlighted columns are for job in-demand. Personnel career development will start from the lowest level, moving upwards]*				
COMPETENCY DESCRIPTION	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
	No Level	**RE Conditioned-Based Monitoring Fitter**	**RE Conditioned-Based Monitoring Analyst**	**No Level**	**No Level**

KNOWLEDGE REQUIREMENT		• Types and application of pumps which include:
		  • centrifugal (horizontal)
		  • centrifugal (vertical)
		  • plunger
		  • screw
		  • diaphragm
		• Safe work practices which include:
		  • Working at Height
		  • Working in Confined Space
		  • Housekeeping at Workplace
			• Interpret pump high vibration notification.
			• Basic troubleshooting of pumps high vibration which includes:
			  • flow-related
			  • high temperature-related
			  • pump misalignment
			• Technical writing skill.
			• People management skill.
			• Interpersonal skill.
			• Communications skill.
			• 3R concept; Reduce, Reuse, Recycle.		

ABILITIES REQUIREMENT		• Interpret condition-based monitoring requirements.
		• Carry out condition-based monitoring:
		  • vibration reading
		  • noise/ abnormality check
		  • lubrication oil check
		• Perform lube-oil sample taking.
		• Upload vibration data into computer.
		• Perform screening of vibration data which includes:
		  • high vibration single-reading
		  • high vibration reading trend
		• Adhere to safety procedures.
		• Respond to unsafe conditions at work place.
			• Carry out vibration analysis which includes:
			  • screening of high vibration; single or trend reading
			  • revision of vibration reading taking frequency
			• Perform basic vibration troubleshooting.
			• Conduct basic testing to determine high vibration reading.
			• Prepare vibration analysis report.
			• Monitor adherence to safety procedures.
			• Conscious onof unsafe conditions surrounding the work place.
			• Concern about sustainability and wastage.		

SKILL AREA	Onshore Facilities & Downstream Plants Skillsets in Maintenance Activities				
SKILLSET	**FLANGE MANAGEMENT**				
SKILL DESCRIPTION	Flange management works describe the activities of ensuring mechanical joint integrity of equipment nozzle or piping flanges to prevent from joint leakage. The job involves ensuring proper components used and tightening method employed in order to provide joint integrity assurance and leak-free operations. *[NOTE: Highlighted columns are for job in-demand. Personnel career development will start from the lowest level, moving upwards]*				
COMPETENCY DESCRIPTION	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
	Bolting Fitter	**Bolter**	**Bolting Foreman**	**Flange Management Inspector**	**Flange Management Superintendent**

KNOWLEDGE REQUIREMENT	• Types of flanges which include:
	  • flat-face
	  • raised-face
	  • ring-joint face
	  • lap-joint face
	  • male & female face
	  • tongue & groove face
	• Safe work practices which include:
	  • Working at Height
	  • Working in Confined Space
	• Housekeeping at Workplace
		• Basic understanding of isometric drawing which includes:
		  • flange type
		  • gasket specifications
		  • bolts/ nuts specifications
		• Safe work practices which include:
		  • Working at Height
		  • Working in Confined Space
		  • Housekeeping at Workplace
			• Basic understanding of P&ID drawing which includes:
			  • piping class/ specifications
			  • ASME relevant codes and standards
			• Technical writing skill.
			• People management skill.
			• Interpersonal skill.
			• Communications skill.
			• 3R concept; Reduce, Reuse, Recycle.
				• Basic understanding of drawings which includes:
				  • P&ID
				  • piping general arrangements
				  • piping isometric
				• Types of piping joint tightness defects.
				• Technical writing skill.
				• People management skill.
				• Interpersonal skill.
				• Communications skill.
				• 3R concept; Reduce, Reuse, Recycle.	

ABILITIES REQUIREMENT	• Interpret scope of work as per job instruction.
	• Check flanges parallelism.
	• Perform pre-tightening check which includes:
	  • flange faces
	  • gasket type
	  • stud-bolts/ nuts specifications
	• Apply molykote lubricant onto the stud-bolts and nuts.
	• Perform flange joint tightening technique which includes:
	  • manual torque wrench
	  • hydraulic torque wrench
	• Prepare joint tightening checklist.
	• Adhere to safety procedures.
	• Respond to unsafe conditions at work place.
		• Interpret piping isometric drawings.
		• Perform flange joint tightening technique which includes:
		  • manual torque wrench
		  • hydraulic torque wrench
		  • hydraulic bolt tensioning
		• Prepare joint completion certificate.
		• Adhere to safety procedures.
		• Respond to unsafe conditions at work place.
			• Interpret P&ID drawings.
			• Interpret torquing value.
			• Prepare work schedule and manpower assignment.
			• Verify flange joint tightness.
			• Monitor adherence to safety procedures.
			• Conscious of unsafe conditions surrounding the work place.
			• Hazard risk assessment and documentation which includes:
			  • Job Safety Analysis (JSA)
			  • Permit to Work (PTW)
			  • Toolbox Briefing
			• Prepare work schedule and manpower assignment.
				• Interpret P&ID, piping class and isometric drawings.
				• Inspect flange joint tightness which includes:
				  • flange visual conditions
				  • flange parallelism
				  • flange spacing/ gap
				  • bolts/ nut looseness
				  • uneven stud-bolts length
				  • gasket specifications
				  • tightening method/ specification
				• Monitor adherence to safety procedures.
				• Conscious of unsafe conditions surrounding the work place.
				• Concern about sustainability and wastage.	

SKILL AREA	Onshore Facilities & Downstream Plants Skillsets in Maintenance Activities				
SKILLSET	**RADIOGRAPHIC TESTING**				
SKILL DESCRIPTION	Radiographic testing (RT) works describe the activities of performing non-destructive examination (NDE) technique that involves the use of either gamma-rays or x-rays to view the internal structure of a component. In the oil & gas industry, RT is often used to inspect machinery, such as pressure vessels and piping, to detect flaws. *[NOTE: Highlighted columns are for job in-demand. Personnel career development will start from the lowest level, moving upwards]*				
COMPETENCY DESCRIPTION	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
	Radiographic Testing Technician Level-1	**Radiographic Testing Technician Level-2**	**Radiographic Testing Supervisor**	**No Level**	**No Level**

KNOWLEDGE REQUIREMENT	• Malaysian regulations on handling and transporting radiographic testing materials.
	• Understanding of drawings which includes:
	  • Plot Plan
	  • General Arrangement
	  • Isometric drawing
	• Safe exposure limits as radiographic testing operator which includes:
	  • personal exposure monitoring badge
	  • safe exposure distant and duration
	• Radiographic testing operating practices which include:
	  • strength of source
	  • thickness of material versus exposure time
	• Codes and standards for welding flaws and defects which include:
	  • porosity
	  • slag intrusion
	  • undercut
	  • insufficient penetration
	• Safe work practices which include:
	  • Working at Height
	  • Working in Confined Space
	  • Housekeeping at Workplace
		• Malaysian regulations on handling and transporting radiographic testing materials.
		• Setting up requirements for radiographic developing room.
		• Storage requirements of radiographic source.
		• Understanding limitations of radiographic testing method.
		• Prepare work schedule and manpower assignment.
		• Perform basic troubleshooting of radiographic testing equipment.
		• Technical writing skill.
		• People management skill.
		• Interpersonal skill.
		• Communications skill.
		• Safe work practices which include:
		  • Working at Height
		  • Working in Confined Space
		  • Housekeeping at Workplace			

COMPETENCY DESCRIPTION	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
	Radiographic Testing Technician Level-1	**Radiographic Testing Technician Level-2**	**Radiographic Testing Supervisor**	**No Level**	**No Level**

ABILITIES REQUIREMENT	• Interpret radiography testing scope of work.
	• Perform x-ray/gamma ray radiography testing equipment periodic check.
	• Carry out x-ray/gamma ray radiographic testing equipment inventory control.
	• Transport and store x-ray/gamma ray radiographic testing equipment as per regulatory requirements.
	• Setup x-ray/gamma ray radiographic testing which includes:
	  • locate test area
	  • condone hazardous boundary
	  • identify equipment location
	• Conduct x-ray/gamma ray radiography shoot of test piece which includes:
	  • tag joint for identification
	  • place radiography film
	  • place radiography source
	  • shoot based on source exposure time
	• Perform radiography film processing which includes:
	  • setup dark room
	  • automatic/manual film processing
	• Interpret radiographic test result as per codes and standards.
	• Prepare radiographic test report.
	• Adhere to safety procedures.
	• Respond to unsafe conditions at work place.
		• Interpret radiography testing scope of work against applicable Radiographic Testing Procedure.
		• Validate x-ray/gamma ray radiography testing equipment periodic check.
		• Coordinate x-ray/gamma ray radiographic testing equipment inventory replenishment.
		• Coordinate storage of x-ray/gamma ray radiographic testing equipment with Client as per regulatory requirements.
		• Select and define the limitations and advantages of radiographic test method.
		• Provide x-ray/gamma ray radiographic testing guidance.
		• Conduct x-ray/gamma ray radiography shoot on test piece which includes:
		  • tag joint for identification
		  • place radiography film
		  • place radiography source
		  • shoot based on source exposure time
		• Verify interpretation of radiographic test result as per codes and standards.
		  • re-shoot, if necessary
		  • accept/reject interpretation
		• Validate radiographic test report.
		• Present radiographic test result to Client.
		• Monitor adherence to safety procedures.
		• Conscious of unsafe conditions surrounding the work place.
		• Concern about sustainability and wastage.			

SKILL AREA	Onshore Facilities & Downstream Plants Skillsets in Maintenance Activities				
SKILLSET	**DYE PENETRANT TESTING**				
SKILL DESCRIPTION	Dye penetrant testing (DPT) works describe the activities of performing non-destructive examination (NDE) technique widely used to detect surface breaking flaws such as cracks, porosity, laps, seams and other surface discontinuities. *[NOTE: Highlighted columns are for job in-demand. Personnel career development will start from the lowest level, moving upwards]*				
COMPETENCY DESCRIPTION	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
	Dye Penetrant Testing Technician Level-1	**Dye Penetrant Testing Technician Level-2**	**Dye Penetrant Testing Supervisor**	**No Level**	**No Level**

KNOWLEDGE REQUIREMENT	• Test piece preparation requirements which include:
	  • surface condition
	  • surface temperature
	• Understanding of drawings which includes:
	  • Plot Plan
	  • General Arrangement
	  • Isometric drawing
	• Codes and standards for welding flaws and defects.
		• Understanding limitations of dye penetrant testing method.
		• Prepare work schedule and manpower assignment.
		• Codes and standards for welding flaws and defects.
		• Technical writing skill.
		• People management skill.
		• Interpersonal skill.
		• Communications skill			

ABILITIES REQUIREMENT	• Interpret dye penetrant testing scope of work.
	• Carry out dye penetrant testing equipment inventory control.
	• Conduct dye penetrant testing on test piece which includes:
	  • prepare joint surface area
	  • fluorescent and visible penetrant testing
	  • wet/dry penetrant testing
	  • observe readings
	• Interpret dye penetrant test result as per codes and standards.
	• Prepare dye penetrant test report.
	• Adhere to safety procedures.
	• Respond to unsafe conditions at work place.
		• Select and define limitations and advantages of dye penetrant testing technique.
		• Coordinate dye penetrant testing inventory replenishment.
		• Provide dye penetrant testing guidance.
		• Perform dye penetrant testing interpretation and evaluation according to codes, standards, specifications and procedures.
		• Supervise dye penetrant testing of Technician Level-1.
		• Validate dye penetrant test report by Technician Level-1.
		• Present dye penetrant test result to Client.
		• Monitor adherence to safety procedures.
		• Conscious of unsafe conditions surrounding the work place.
		• Concern about sustainability and wastage.			

SKILL AREA	Onshore Facilities & Downstream Plants Skillsets in Maintenance Activities				
SKILLSET	**ELECTRICAL**				
SKILL DESCRIPTION	Electrical maintenance works describe the activities of fault diagnosis, routine servicing and maintenance of electrical equipment or components, electrical system as well as laying and termination of electrical cabling works. In the oil & gas industry, Ex rated equipment and components are used based on the hazardous area classification requirements. *[NOTE: Highlighted columns are for job in-demand. Personnel career development will start from the lowest level, moving upwards]*				
COMPETENCY DESCRIPTION	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
	No Level	**Wireman**	**Electrical Technician**	**Electrical Chargeman**	**No Level**

KNOWLEDGE REQUIREMENT		• Understand single-line diagram.
		• Safe work practices which include:
		  • Working at Height
		  • Working in Confined Space
		  • Housekeeping at Workplace
			• Electricity fundamentals and physics.
			• Process, electrical equipment and electrical drawings.
			• Megger Test procedures and acceptable limits.
			• Lock-Out, Tag-Out (LOTO) rules and procedures.
			• Hazards, electrical risk and safety at work.
			• Protections layers concept.
			• Technical writing skill.
			• People management skill.
			• Interpersonal skill.
			• Communications skill.
			• 3R concept; Reduce, Reuse, Recycle.		

ABILITIES REQUIREMENT		• Interpret wiring diagram and electrical circuit. • Carry out installation and repair of electrical wiring. • Perform electrical wiring continuity check. • Adhere to safety procedures. • Respond to unsafe conditions at work place.	• Interpret scope of electrical equipment defect. • Repair/replace electrical equipment component. • Conduct electrical motor Megger test. • Carry out motor overhauling work. • Coordinate motor stator rewinding works. • Prepare motor overhauling report. • Monitor adherence to safety procedures. • Conscious of unsafe conditions surrounding the work place. • Concern about sustainability and wastage.		

SKILL AREA	Onshore Facilities & Downstream Plants Skillsets in Maintenance Activities				
SKILLSET	**FIELD INSTRUMENTATION**				
SKILL DESCRIPTION	Field instrumentation maintenance works describe the activities of fault diagnosis, routine servicing and maintenance of process control instrumentations such as levels, flow, pressure, temperature, pH and humidity. In the oil & gas industry, Ex rated equipment and components are used based on the hazardous area classification requirements. *[NOTE: Highlighted columns are for job in-demand. Personnel career development will start from the lowest level, moving upwards]*				
COMPETENCY DESCRIPTION	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
	No Level	**Field Instrument Fitter**	**Field Instrument Technician**	**Field Instrument Inspector**	**Field Instrument Superintendent**

KNOWLEDGE REQUIREMENT		• Knowledge in instrumentation and control.
		• Basic knowledge of hazardous area classification and explosion-proof requirements.
		• Safe work practices which include:
		  • Working at Height
		  • Working in Confined Space
		  • Housekeeping at Workplace
			• Knowledge in instrumentation, process control and safeguarding.
			• Basic troubleshooting of instrument problems.
			• Technical writing skill.
			• People management skill.
			• Interpersonal skill.
			• Communications skill.
			• 3R concept; Reduce, Reuse, Recycle.
				• Basic area classification and gas groups.
				• Understanding of Hazardous Area Classification.
				• Understanding types of glands and fittings.
				• Understanding Ingress Protection (IP) types and application.
				• Technical writing skill.
				• People management skill.
				• Interpersonal skill.
				• Communications skill.
				• 3R concept; Reduce, Reuse, Recycle.	

ABILITIES REQUIREMENT		• Interpret scope of work.
		• Remove/install field transmitter, including instrument tubing.
		• Remove/install control valve, including actuator and instrument air tubing.
		• Repair field transmitter in loop test/on bench.
		• Repair control valve in loop test/on bench.
		• Lay and terminate instrument cable.
		• Install small-bore process piping/ instrument tubing.
		• Record removal, installation, calibration and testing work in check sheet.
		• Install and inspect instrument junction box.
		• Adhere to safety procedures.
		• Respond to unsafe conditions at work place.
			• instrument assembly and tubing connections for mechanical joint integrity.
			• Perform troubleshooting of instrument and control loop problem.
			• Verify laying of instrument cable.
			• Verify calibration and testing of instrument fixtures which include:
			  • control valves
			  • transmitters
			• Inspect instrument junction box.
			• Monitor adherence to safety procedures.
			• Conscious of unsafe conditions surrounding the work place.
			• Concern about sustainability and wastage.
				• Inspect field instrumentation and control which include:
				  • gauges
				  • transmitters
				  • thermocouples
				  • orifice and connections
				• Inspect wiring/ cabling and cable glanding.
				• Check equipment protection level which includes:
				  • Flameproof: Ex(d)
				  • Non Sparking Ex(n)
				  • Intrinsically Safe: Ex(i)
				  • Increased Safety: Ex(e)
				• Inspect types and application of Ingress Protection (IP) equipment.
				• Check safety markings and signage.	

SKILL AREA	Onshore Facilities & Downstream Plants Skillsets in Maintenance Activities				
SKILLSET	**SAFEGUARDING SYSTEM (SGS) INSTRUMENTATION**				
SKILL DESCRIPTION	Safeguarding system (SGS) instrumentation maintenance works describe the activities of fault diagnosis, routine servicing and maintenance of process protection system against uncontrolled loss of containment of hazardous materials. In the oil & gas industry, Ex rated equipment and components are used based on the hazardous area classification requirements. *[NOTE: Highlighted columns are for job in-demand. Personnel career development will start from the lowest level, moving upwards]*				
COMPETENCY DESCRIPTION	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
	No Level	**SGS Instrumentation Fitter**	**SGS Instrumentation Technician**	**SGS Instrumentation Supervisor**	**SGS Instrumentation Superintendent**
KNOWLEDGE REQUIREMENT			• Knowledge in instrumentation, process control and safeguarding. • Knowledge in Cause & Effect Matrix. • Basic troubleshooting of safeguarding and IPF. • Technical writing skill. • People management skill. • Interpersonal skill. • Communications skill. • 3R concept; Reduce, Reuse, Recycle.		
ABILITIES REQUIREMENT			• Verify repair of SGS system components. • Perform troubleshooting of safeguarding/IPF systems. • Perform testing/ commissioning of SGS/PLC. • Translate Cause & Effect Matrix into safeguarding logic. • Monitor adherence to safety procedures. • Conscious of unsafe conditions surrounding the work place. • Concern about sustainability and wastage.		

SKILL AREA	Onshore Facilities & Downstream Plants Skillsets in Maintenance Activities				
SKILLSET	**DISTRIBUTED CONTROL SYSTEM (DCS) INSTRUMENTATION**				
SKILL DESCRIPTION	Distributed control system (DCS) instrumentation maintenance works describe the activities of fault diagnosis, routine servicing and maintenance of process control loops to integrate various plant systems for visualisation, registration and reporting of these processes. In the oil & gas industry, Ex rated equipment and components are used based on the classification requirements of hazardous areas. *[NOTE: Highlighted columns are for job in-demand. Personnel career development will start from the lowest level, moving upwards]*				
COMPETENCY DESCRIPTION	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
	No Level	**DCS Instrumentation Fitter**	**DCS Instrumentation Technician**	**DCS Instrumentation Supervisor**	**DCS Instrumentation Superintendent**
KNOWLEDGE REQUIREMENT			• Knowledge in instrumentation, process control and safeguarding. • Basic troubleshooting of DCS problems. • Technical writing skill. • People management skill. • Interpersonal skill. • Communications skill. • 3R concept; Reduce, Reuse, Recycle.		
ABILITIES REQUIREMENT			• Verify repair of DCS components. • Perform basic troubleshooting for DCS. • Perform testing/commissioning for SGS/PLC. • Translate basic design of DCS into switching logic and process control loops. • Monitor adherence to safety procedures. • Conscious of unsafe conditions surrounding the work place. • Concern about sustainability and wastage.		

SKILL AREA	Onshore Facilities & Downstream Plants Skillsets in Maintenance Activities				
SKILLSET	**QUALITY MEASURING INSTRUMENTS (QMI)**				
SKILL DESCRIPTION	Quality measuring instruments (QMI) maintenance works describe the activities of fault diagnosis, routine servicing and maintenance of QMI equipment such as flow meters for process or custody measurements of process flows. In the oil & gas industry, Ex rated equipment and components are used based on the classification requirements of hazardous areas. *[NOTE: Highlighted columns are for job in-demand. Personnel career development will start from the lowest level, moving upwards]*				
COMPETENCY DESCRIPTION	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
	No Level	**QMI Fitter**	**QMI Technician**	**QMI Supervisor**	**QMI Superintendent**

KNOWLEDGE REQUIREMENT		• Knowledge in quality measuring instrument.
		• Basic knowledge of hazardous area classification and explosion- proof requirements.
		• Safe work practices which include:
		  • Working at Height
		  • Working in Confined Space
		  • Housekeeping at Workplace
			• Principal knowledge in QMI which includes:
			  • analysers
			  • monitors
			  • chromatographs
			• Basic troubleshooting of QMI problems.
			• Understand regulatory requirements on custody transfer meters.
			• Technical writing skill.
			• People management skill.
			• Interpersonal skill.
			• Communications skill.
			• 3R concept; Reduce, Reuse, Recycle.		

ABILITIES REQUIREMENT		• Repair/replace QMI components. • Carry out testing of QMI components. • Prepare documents, manuals, procedures, drawings for QMI systems. • Adhere to safety procedures. • Respond to unsafe conditions at work place.	• Verify repair of QMI components. • Perform basic troubleshooting for QMI. • Perform testing/commissioning for QMI equipment. • Coordinate calibration of custody transfer meters to regulatory requirements. • Monitor adherence to safety procedures. • Conscious of unsafe conditions surrounding the work place. • Concern about sustainability and wastage.		

Skills & Description of Competencies

Onshore Facilities & Downstream Plant Skillsets in Turnaround Activities

Skillsets:

- Structure Welding
- Pipe Welding
- Pipe Fitting
- Rigging & Slinging
- Hydro-jetting
- Scaffolding
- Insulation
- Refractory
- Blasting & Painting
- Valve Overhauling
- Rotating Equipment
- Flange Management
- Radiographic Testing
- Ultrasonic Testing
- Eddy Current Testing
- Dye Penetrant Testing
- Magnetic Particle Testing
- Electrical
- Field Instrumentation
- Safeguarding System (SGS) Instrumentation
- Distributed Control System (DCS) Instrumentation
- Quality Measuring Instruments (QMI)

SKILL AREA	Onshore Facilities & Downstream Plants Skillsets in Turnaround Activities				
SKILLSET	**STRUCTURE WELDING**				
SKILL DESCRIPTION	Structural welding works describe the activities of jointing two pieces of plates or structural materials. The job involves various welding techniques to fuse plates and structural materials such as beams, columns, rods and other fixtures to form a complete or part of structure or metalwork. *[NOTE: Highlighted columns are for job in-demand. Personnel career development will start from the lowest level, moving upwards]*				
COMPETENCY DESCRIPTION	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
	Welding Assistant	**Structural Welder**	**Structural Welding Foreman**	**Welding Supervisor**	**Welding Superintendent**

KNOWLEDGE REQUIREMENT		• Types of construction drawings which include:
		  • Plan view, Cross-sectional drawings;
		  • Shop drawings.
		• Types of welding techniques and its applications which include:
		  • Shielded Metal Arc Welding (SMAW)
		  • Gas Metal Arc Welding (GMAW)
		  • Flux Core Arc Welding (FCAW)
		  • Submerged Arc Welding (SAW)
		• Safe work practices which include:
		  • Working at Height
		  • Working in Confined Space
		  • Housekeeping at Workplace
			• Welding Practice documents which include:
			  • Welding Qualification Test (WQT)
			  • Welding Procedure Specification (WPS)
			  • Procedure Qualification Record (PQR)
			• Types of welding defects which include:
			  • Cracks
			  • Undercutting
			  • Slag/flux inclusion
			• Types of welding Non-Destructive Testings (NDT) which include:
			  • Dye Penetrant Test (DPT)
			  • Radiography Test (RT)
			  • Magnetic Particle Test (MPT)
			  • Ultrasonic Test (UT)
			• Hazard risk assessments and documentation which include:
			  • Job Safety Analysis (JSA)
			  • Permit to Work (PTW)
			  • Toolbox Briefing
			• Prepare work schedule and manpower assignment.
			• Technical writing skill.
			• People management skill.
			• Interpersonal skill.
			• Communications skill.
			• 3R concept; Reduce, Reuse, Recycle.		

COMPETENCY DESCRIPTION	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
	Welding Assistant	**Structural Welder**	**Structural Welding Foreman**	**Welding Supervisor**	**Welding Superintendent**

ABILITIES REQUIREMENT		• Calibrate welding tools and equipment as per parameters listed in the Welding Procedure Specification (WPS).
		• Secure and fasten structural components using clamps, braces, jacks and bolt straps.
		• Carry out post-welding treatment of structures by cleaning, buffing and polishing finished workpieces.
		• Utilise manual and mechanical processes to weld in various positions.
		• Carry out fillet, tack and full penetration welding on structural joints.
		• Perform welding techniques which includes:
		  • Shielded Metal Arc Welding (SMAW)
		  • Gas Metal Arc Welding (GMAW)
		  • Flux Core Arc Welding (FCAW)
		  • Submerged Arc Welding (SAW)
		• Perform chipping and cleaning between weld layers.
		• Perform initial visual inspection after completion of welds.
		• Adhere to safety procedures.
		• Respond to unsafe conditions at work place.
			• Interpret Welding Procedure Specification (WPS).
			• Analyse structural drawings to layout the framework of a structure for joint design and configuration.
			• Inspect and evaluate welds to ensure they are free of defects and conform to specifications.
			• Conduct estimations to determine the bill of quantity for materials required for a welding project.
			• Employ appropriate welding methods in completing structural fabrications.
			• Coordinate Non-Destructive Testing (NDT) and Destructive Test (DT) for finished weld-joints.
			• Identify and initiate repair of weld defects.
			• Prepare work schedule and manpower assignment.
			• Perform supervisory function on welding and cutting techniques which includes:
			  • Shielded Metal Arc Welding (SMAW)
			  • Gas Metal Arc Welding (GMAW)
			  • Flux Core Arc Welding (FCAW)
			  • Submerged Arc Welding (SAW)
			• Perform audit on welders in accordance with standard operating procedure.
			• Monitor adherence to safety procedures.
			• Conscious of unsafe conditions surrounding the work place.
			• Concern about sustainability and wastage.		

SKILL AREA	Onshore Facilities & Downstream Plants Skillsets in Turnaround Activities				
SKILLSET	**PIPE WELDING**				
SKILL DESCRIPTION	Pipe welding works describe the activities of jointing two pieces of pipes or pipe fittings. The job involves various welding technique to fuse pipes and fittings such as elbows, reducers, flanges, valves and other fittings materials to form a complete or spool piece of piping or pipeline. *[NOTE: Highlighted columns are for job in-demand. Personnel career development will start from the lowest level, moving upwards]*				
COMPETENCY DESCRIPTION	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
	Welding Assistant	**Piping Welder**	**Piping Welding Foreman**	**Welding Supervisor**	**Welding Superintendent**

KNOWLEDGE REQUIREMENT		• Types of construction drawings which include:
		  • Piping plan
		  • Isometric drawings
		• Types of welding technique and its application which includes:
		  • Shielded Metal Arc Welding (SMAW)
		  • Gas Metal Arc Welding (GMAW)
		  • Flux Core Arc Welding (FCAW)
		  • Submerged Arc Welding (SAW)
		• Safe work practice which includes:
		  • Working at Height
		  • Working in Confined Space
		  • Housekeeping at Workplace
			• Welding Practice documents which include:
			  • Welding Qualification Test (WQT)
			  • Welding Procedure Specification (WPS)
			  • Procedure Qualification Record (PQR)
			• Knowledge on Welding Map.
			• Types of welding defects which include:
			  • Cracks
			  • Undercutting
			  • Slag/flux inclusion
			• Types of welding Non-Destructive Testing (NDT) which include:
			  • Dye Penetrant Test (DPT)
			  • Radiography Test (RT)
			  • Magnetic Particle Test (MPT)
			  • Ultrasonic Test (UT)
			• Hazard risk assessments and documentation which include:
			  • Job Safety Analysis (JSA)
			  • Permit to Work (PTW)
			  • Toolbox Briefing
			• Prepare work schedule and manpower assignment.
			• Technical writing skill.
			• People management skill.
			• Interpersonal skill.
			• Communications skill.
			• 3R concept; Reduce, Reuse, Recycle.		

COMPETENCY DESCRIPTION	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
	Welding Assistant	**Piping Welder**	**Piping Welding Foreman**	**Welding Supervisor**	**Welding Superintendent**

ABILITIES REQUIREMENT		• Interpret Welding Map.
		• Calibrate welding tools and equipment as per parameters listed in the Welding Procedure Specification (WPS).
		• Secure and fasten pipes & fittings components using clamps, braces, jacks and bolt straps.
		• Carry out post-welding treatment of pipes & fittings by cleaning, buffing and polishing finished workpieces.
		• Utilise manual and mechanical processes to weld in various positions.
		• Perform current adjustment prior to welding.
		• Carry out fillet, tack and full penetration welding on pipes & fittings joints.
		• Perform welding techniques which include:
		  • Shielded Metal Arc Welding (SMAW)
		  • Gas Tungsten Arc Welding (GTAW)
		  • Gas Metal Arc Welding (GMAW)
		  • Flux Core Arc Welding (FCAW)
		  • Submerged Arc Welding (SAW)
		• Perform chipping and cleaning between weld layers.
		• Perform initial visual inspection after completion of welds.
		• Adhere to safety procedures.
		• Respond to unsafe conditions at work place.
			• Prepare Welding Map.
			• Interpret Welding Procedure Specification (WPS).
			• Analyse piping drawings to lay-out the pipes & fittings for joint design and configuration.
			• Inspect and evaluate welds to ensure they are free of defects and conform to specifications.
			• Conduct estimations to determine the bill of quantities for materials required for a welding project.
			• Employ appropriate welding methods in completing pipes & fittings fabrications.
			• Coordinate Non-Destructive Testing (NDT) and Destructive Test (DT) for finished weld-joints.
			• Identify and initiate repair of weld defects.
			• Prepare work schedule and manpower assignment.
			• Perform supervisory function on welding and cutting techniques which includes:
			  • Shielded Metal Arc Welding (SMAW)
			  • Gas Tungsten Arc Welding (GTAW)
			  • Gas Metal Arc Welding (GMAW)
			  • Flux Core Arc Welding (FCAW)
			  • Submerged Arc Welding (SAW)
			• Perform audit on welders in accordance with standard operating procedure.
			• Monitor adherence to safety procedures.
			• Conscious of unsafe conditions surrounding the work place.
			• Concern about sustainability and wastage.		

SKILL AREA	Onshore Facilities & Downstream Plants Skillsets in Turnaround Activities				
SKILLSET	**PIPE FITTING**				
SKILL DESCRIPTION	Pipe fitting works describe the activities of fabrication of piping and pipelines. The job involves cutting, grinding, fit-up and assembly of pipes and fittings such as elbows, reducers, flanges and other fittings materials to form a complete or spool piece of piping or pipeline. *[NOTE: Highlighted columns are for job in-demand. Personnel career development will start from the lowest level, moving upwards]*				
COMPETENCY DESCRIPTION	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
	Pipe Fitting Assistant	**Pipe Fitter**	**Pipe Fitting Foreman**	**Pipe Fitting Supervisor**	**Pipe Fitting Superintendent**

KNOWLEDGE REQUIREMENT		• Types of construction drawings which include:
		  • Piping plan
		  • Isometric drawings
		• Safe work practices which include:
		  • Working at Height
		  • Working in Confined Space
		  • Housekeeping at Workplace
			• Knowledge on Welding Map.
			• Hazard risk assessment and documentation which includes:
			  • Job Safety Analysis (JSA)
			  • Permit to Work (PTW)
			  • Toolbox Briefing
			• Technical writing skill.
			• People management skill.
			• Interpersonal skill.
			• Communications skill.
			• 3R concept; Reduce, Reuse, Recycle.		

ABILITIES REQUIREMENT		• Measure and marking of pipes for cutting. • Perform cutting, threading or hammering pipe to specification. • Perform oxy-cutting of pipe spools. • Perform grinding and fit-up of piping joints for welding. • Assemble pipes, tube fittings and related equipment. • Perform chipping & cleaning for finished work piece. • Perform fitting and assembly of work piece. • Adhere to safety procedures. • Respond to unsafe conditions at work place.	• Interpret piping drawings. • Perform calculation for dimensional work. • Inspect and test installed piping system. • Plan piping system layout, installation or repair works. • Prepare written materials (e.g. work orders, requisitions, drawings, sketches, etc.). • Perform complex fit-up and assembly. • Prepare work schedule and manpower assignment. • Monitor adherence to safety procedures. • Conscious of unsafe conditions surrounding the work place. • Concern about sustainability and wastage.		

SKILL AREA	Onshore Facilities & Downstream Plants Skillsets in Turnaround Activities				
SKILLSET	**RIGGING & SLINGING**				
SKILL DESCRIPTION	Rigging and slinging works describe the activities of lifting and moving heavy loads with ropes, webbing, chains and other mechanical devices such as winches, chain- blocks, pull-lifts and other hoisting equipment. The job involves handling of lifting tools such as eye-bolts, shackles, wire slings and other mechanical lifting devices to perform a safe rigging and slinging works. *[NOTE: Highlighted columns are for job in-demand. Personnel career development will start from the lowest level, moving upwards]*				
COMPETENCY DESCRIPTION	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
	Rigging Assistant	**Rigger**	**Rigging Foreman**	**Rigging Supervisor**	**Rigging Superintendent**

KNOWLEDGE REQUIREMENT		• Types of lifting and slinging equipment which include:
		  • Eye-bolts and shackles.
		  • Webbing, wire ropes, chain slings.
		  • Winches, chain blocks/ pull- lifts.
		• Safe work practices which include:
		  • Working at Height
		  • Working in Confined Space
		  • Housekeeping at Workplace
			• Types of lifting equipment defects which include:
			  • Pitting and corrosion.
			  • Necking.
			• Weight estimation technique.
			• Technical writing skill.
			• People management skill.
			• Interpersonal skill.
			• Communications skill.
			• 3R concept; Reduce, Reuse, Recycle.
				• Lifting plan and procedures.
				• Load test procedures and requirements which include:
				  • Dead weight load
				  • Safe Working Load (SWL)
				• Technical writing skill.
				• People management skill.
				• Interpersonal skill.
				• Communications skill.
				• 3R concept; Reduce, Reuse, Recycle.	

ABILITIES REQUIREMENT		• Inspect and maintain slinging equipment and accessories.
		• Carry out periodic load-test of listing equipment.
		• Analyse objects to be lifted, shape and weight distribution.
		• Select suitable slinging equip-ment.
		• Record use of lifting and sling-ing equipment.
			• Verify lifting equipment fit for use.
			• Organise load test.
			• Interpret lifting procedure.
			• Develop lifting equipment inspection schedule.
			• Develop lifting equipment inspection checklist.
			• Carry out inspection of minor lifting equipment.
			• Prepare work schedule and manpower assignment.
			• Monitor adherence to safety procedures.
			• Conscious of unsafe conditions surrounding the work place.
			• Concern about sustainability and wastage.
				• Prepare lifting procedure.
				• Prepare lifting plan.
				• Supervise rigging operation.
				• Carry out inspection of major lifting equipment.
				• Verify inspection of equipment.
				• Coordinate DOSH visit for PMA equipment.
				• Hazard risk assessment and documentation which includes:
				  • Job Safety Analysis (JSA)
				  • Permit to Work (PTW)
				  • Toolbox Briefing
				• Prepare work schedule and manpower assignment.	

SKILL AREA	Onshore Facilities & Downstream Plants Skillsets in Turnaround Activities				
SKILLSET	**RIGGING & SLINGING**				
SKILL DESCRIPTION	Rigging and slinging works describe the activities of lifting and moving heavy loads with ropes, webbing, chains and other lifting mechanism. The job involves operating of mobile cranes of different safe working load capacity to lift and sling the lifted object across an area of lift radius. *[NOTE: Highlighted columns are for job in-demand. Personnel career development will start from the lowest level, moving upwards]*				
COMPETENCY DESCRIPTION	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
	No Level	**Signalman**	**Crane Operator**	**No Level**	**No Level**

KNOWLEDGE REQUIREMENT			• Knowledge on estimation of load weight and centre of gravity (CG).
			• Crane Load Chart
			  • boom length versus lifting capacity
			  • with/without outrigger fully extended
			• Safe work practices which include:
			  • soft-ground
			  • underground cables or piping
			  • swing activities over human or equipment		

ABILITIES REQUIREMENT			• Ensure stability of crane and extension of outrigger on hard, flat surface. • Observe balance of lifting load by initial lift. • Inspect hoisting equipment such as sling-wire, shackles, crane wire- rope, hook, etc. • Carry out lifting of objects; ensure safe operation of lift. • Plan swing direction of load. • Interpret lifting signal by signalman or foreman.		

SKILL AREA	Onshore Facilities & Downstream Plants Skillsets in Turnaround Activities				
SKILLSET	**HYDRO-JETTING**				
SKILL DESCRIPTION	Hydro-jetting describes the activities of blast cleaning of water at high pressure into small-bore pipes or tubes, in particular heat-exchanger tubes; both internally and externally. At times, hydro-jetting activities also involved in metal cutting especially in presence of hydrocarbon. *[NOTE: Highlighted columns are for job in-demand. Personnel career development will start from the lowest level, moving upwards]*				
COMPETENCY DESCRIPTION	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
	Hydro-jetting Assistant	**Hydro-jetting Operator**	**Hydro-jetting Foreman**	**Hydro-jetting Supervisor**	**Hydro-jetting Superintendent**

KNOWLEDGE REQUIREMENT		• Types of hydro-jetting cleaning nozzles: applications and limitations.
		• Safe work practices which include:
		  • Working at Height
		  • Working in Confined Space
		  • Housekeeping at Workplace
			• Safe operating procedures for hydro-jetting activities.
			• Technical writing skill.
			• People management skill.
			• Interpersonal skill.
			• Communications skill.
			• 3R concept; Reduce, Reuse, Recycle.		

ABILITIES REQUIREMENT		• Interpret scope of hydro-jetting deliverables. • Inspect and use of rigging aids such as block and tackle, chain hoist. • Select proper lances, hoses, fittings and nozzles as per cleaning the requirements. • Select pumping rate to suit cleaning operation. • Determine use of cleaning chemical. • Operate high pressure water jetting equipment. • Carry out hydro-jetting cleaning in open space. • Carry out hydro-jetting cleaning in confined space. • Take safety precautions around work area. • Adhere to safety procedures. • Respond to unsafe conditions at work place.	• Prepare hydro-jetting plan. • Verify safety of hydro-jetting fittings such as lances, hoses, fittings and nozzles. • Liaise with Client on scope of cleaning requirements. • Carry out cleaning operation inspection to ensure safety and quality aspect of work delivery. • Prepare work schedule and manpower assignment. • Control use of cleaning chemical. • Liaise with Client on af-ter-cleaning inspection. • Monitor adherence to safety procedures. • Conscious of unsafe conditions surrounding the work place. • Concern about sustainability and wastage.		

SKILL AREA	Onshore Facilities & Downstream Plants Skillsets in Turnaround Activities				
SKILLSET	**SCAFFOLDING**				
SKILL DESCRIPTION	Scaffolding works describe the activities of erecting and dismantling tubular-type or modular-type structure for falsework, access and/or working platform. *[NOTE: Highlighted columns are for job in-demand. Personnel career development will start from the lowest level, moving upwards]*				
COMPETENCY DESCRIPTION	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
	Level 1 Scaffolder	**Level 2 Scaffolder**	**Scaffolder Foreman**	**Scaffolder Supervisor**	**No Level**

KNOWLEDGE REQUIREMENT	• Basic components of metal scaffolding which include:
	  • tubes
	  • couplers
	  • boards/ decking
	• Fall protection.
	• Safe work practices which include:
	  • Working at Height
	  • Working in Confined Space
	  • Housekeeping at Workplace
		• Types of scaffolding which include:
		  • single scaffolding
		  • double scaffolding
		  • tubular scaffolding
		  • cantilever scaffolding
		• Fall protection.
		• Safe work practices which include:
		  • Working at Height
		  • Working in Confined Space
		  • Housekeeping at Workplace
			• Scaffold Standards:
			  • MS 1462 Metal Scaffolding
			  • BS 1139 Metal Scaffolding
			• Basic types of scaffolds which include:
			  • supported scaffolds
			  • suspended scaffolds
			• Technical writing skill.
			• People management skill.
			• Interpersonal skill.
			• Communications skill.
			• 3R concept; Reduce, Reuse, Recycle.
				• Scaffold Standards:
				  • MS 1462 Metal Scaffolding
				  • BS 1139 Metal Scaffolding
				• Technical writing skill.
				• People management skill.
				• Interpersonal skill.
				• Communications skill.
				• 3R concept; Reduce, Reuse, Recycle.	

ABILITIES REQUIREMENT	• Check fit-for-use of scaffolding materials and accessories.
	• Interpret scaffolding drawing.
	• Construct scaffolding which includes:
	  • static tower scaffolding
	  • independent scaffolding
	  • bird cage scaffolding
	  • putlog scaffolding
	  • trestle scaffolding
	• Maintain scaffolding fittings.
	• Adhere to safety procedures.
		• Check fit-for-use of scaffolding materials and accessories.
		• Interpret scaffolding drawing.
		• Construct scaffolding which includes:
		  • mobile tower scaffolding
		  • cantilever scaffolding
		  • suspended scaffolding
		  • truss-out (spur) scaffolding
		  • truck access/ gantry scaffolding
		  • slung scaffolding
		  • shoring system
		  • false work
		  • flying shore
		  • raking shore
		• Maintain scaffolding fittings.
		• Respond to unsafe conditions
			• Conduct hazard risk assessment which includes:
			  • Job Method Statement (JMS)
			  • Job Safety Analysis (JSA)
			  • Permit to Work (PTW)
			  • Toolbox Briefing
			• Perform work planning and scheduling which includes:
			  • materials and consumables planning
			  • tools and equipment optimisation
			  • manpower assignment
				• Interpret use of scaffolding which includes:
				  • falsework
				  • access platform
				  • working platform
				• Inspect scaffolding fit-for-use.
				• Assess scaffolding fitness periodically; after strong wind, heavy downpour, modifications made, expiry date.
				• Monitor adherence to safety procedures.
				• Conscious of unsafe conditions surrounding the work place.
				• Concern about sustainability and wastage.	

SKILL AREA	Onshore Facilities & Downstream Plants Skillsets in Turnaround Activities				
SKILLSET	**INSULATION**				
SKILL DESCRIPTION	Insulation works describe the activities of applying insulation materials to piping or process equipment or other mechanical systems in order to help control and maintain temperature; such as application of rockwool or calcium silicate and aluminium sheet protection for weather or contact damage. *[NOTE: Highlighted columns are for job in-demand. Personnel career development will start from the lowest level, moving upwards]*				
COMPETENCY DESCRIPTION	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
	Insulation Assistant	**Insulator**	**Insulation Foreman**	**Insulation Supervisor**	**Insulation Superintendent**

KNOWLEDGE REQUIREMENT		• Basic principal of insulation.
		• Safe work practices which include:
		  • Working at Height
		  • Working in Confined Space
		  • Housekeeping at Workplace
			• Types of cold insulation.
			• Types of hot insulation which include:
			  • rockwool
			  • calcium silicate
			• Technical writing skill.
			• People management skill.
			• Interpersonal skill.
			• Communications skill.
			• 3R concept; Reduce, Reuse, Recycle.		

ABILITIES REQUIREMENT		• Interpret structural and piping drawings.
		• Measure and cut insulation materials for covering surface.
		• Carry out pre-forming of insulation cladding.
		• Perform insulation installation on piping, equipment or structures.
		• Remove and seal-off old insulation.
		• Adhere to safety procedures.
		• Respond to unsafe conditions at work place.
			• Calculate requirements of insulation materials which includes:
			  • rockwool material
			  • cladding material
			• Prepare work schedule and manpower assignment.
			• Monitor adherence to safety procedures.
			• Conscious of unsafe conditions surrounding the work place.
			• Concern about sustainability and wastage.
			• Hazard risk assessment and documentation which includes:
			  • Job Safety Analysis (JSA)
			  • Permit to Work (PTW)
			  • Toolbox Briefing
			• Prepare work schedule and manpower assignment.		

SKILL AREA	Onshore Facilities & Downstream Plants Skillsets in Turnaround Activities				
SKILLSET	**REFRACTORY**				
SKILL DESCRIPTION	Refractory works describe the activities of applying refractory materials to high temperature process equipment or other mechanical systems in order to help insulation of high temperature in process equipment or to protect high temperature from damaging the metal parts of the equipment; such as application of bricks or casting of mortar over the parts to be protected. *[NOTE: Highlighted columns are for job in-demand. Personnel career development will start from the lowest level, moving upwards]*				
COMPETENCY DESCRIPTION	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
	Refractory Assistant	**Refractory Applicator**	**Refractory Supervisor**	**No Level**	**No Level**

KNOWLEDGE REQUIREMENT		• Basic principal of refractory which includes:
		  • casting
		  • pump casting
		  • gunite
		  • shotcrete
		• Safe work practices which include:
		  • Working at Height
		  • Working in Confined Space
		  • Housekeeping at Workplace
			• Refractory construction drawings which includes:
			  • wall tubes
			  • burner throat
			• Types of refractory: applications and limitations.
			• Technical writing skill.
			• People management skill.
			• Interpersonal skill.
			• Communications skill.
			• 3R concept; Reduce, Reuse, Recycle.		

ABILITIES REQUIREMENT		• Interpret structural and piping drawings.
		• Perform refractory application which includes:
		  • casting
		  • pump casting
		  • gunite
		  • shotcrete
		• Maintenance and testing of refractories application tools and equipment.
		• Adhere to safety procedures.
		• Respond to unsafe conditions at work place.
			• Types of refractory materials and their applications which includes:
			  • fireclay refractory
			  • silica brick refractory
			  • high alumina refractory
			• Hazard risk assessments which include:
			  • Job Method Statement (JMS)
			  • Job Safety Analysis (JSA)
			  • Permit to Work (PTW)
			  • Toolbox Briefing
			• Prepare work schedule and manpower assignment.		

SKILL AREA	Onshore Facilities & Downstream Plants Skillsets in Turnaround Activities				
SKILLSET	**BLASTING & PAINTING**				
SKILL DESCRIPTION	Blasting & painting works describe the activities of surfaces preparation and coating application of structures or piping or equipment to a defined standard for protection of the surface from rust or corrosion damage due to exposure to the environment. *[NOTE: Highlighted columns are for job in-demand. Personnel career development will start from the lowest level, moving upwards]*				
COMPETENCY DESCRIPTION	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
	Blaster Assistant	**Blaster**	**Blasting & Painting Inspector**	**Blasting & Painting Supervisor**	**Blasting & Painting Superintendent**

KNOWLEDGE REQUIREMENT		• Blasting specifications in oil & gas industry.
		• Blasting application technique: its advantages and limitations.
		• Safe work practices which include:
		  • Working at Height
		  • Working in Confined Space
		  • Housekeeping at Workplace
			• Basic blasting & painting controlled parameters which include:
			  • temperature/humidity/ wind
			  • humidity
			  • wind
			• Technical writing skill.
			• People management skill.
			• Interpersonal skill.
			• Communications skill.
			• 3R concept; Reduce, Reuse, Recycle.		

ABILITIES REQUIREMENT		• Interpret blasting requirements.
		• Carry out preparation which includes:
		  • surface preparation
		  • protection works such as masking/ patching
		• Maintain blasting tools.
		• Perform blasting work which includes:
		  • St. 2/ St. 3
		  • Sa 3/ Sa 2/ Sa 1/ Sa 2.5
		• Adhere to safety procedures.
		• Respond to unsafe conditions at work place.
			• Interpret Client requirements.
			• Inspect blasting works which include:
			  • type of blasting materials
			  • surface finish
			• Inspect painting preparation which includes:
			  • work piece surface temperature
			  • environment humidity
			• Inspect painting works which include:
			  • paint specification
			  • painting application
			  • painting thickness
			• Monitor adherence to safety procedures.
			• Conscious of unsafe conditions surrounding the work place.
			• Concern about sustainability and wastage.		

SKILL AREA	Onshore Facilities & Downstream Plants Skillsets in Turnaround Activities				
SKILLSET	**BLASTING & PAINTING**				
SKILL DESCRIPTION	Blasting & painting works describe the activities of surface preparation and coating application of structures or piping or equipment to a defined standard for protection of the surface from rust or corrosion damage due to exposure to the environment. *[NOTE: Highlighted columns are for job in-demand. Personnel career development will start from the lowest level, moving upwards]*				
COMPETENCY DESCRIPTION	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
	Painting Assistant	**Painter**	**Blasting & Painting Inspector**	**Blasting & Painting Supervisor**	**Blasting & Painting Superintendent**

KNOWLEDGE REQUIREMENT		• Coating application specifications in oil & gas industry.
		• Painting application technique: its advantages and limitations.
		• Safe work practices which include:
		  • Working at Height
		  • Working in Confined Space
		  • Housekeeping at Workplace
			• Basic blasting & painting controlled parameters which include:
			• temperature/ humidity/ wind
			• Technical writing skill.
			• People management skill.
			• Interpersonal skill.
			• Communications skill.
			• 3R concept; Reduce, Reuse, Recycle.		

ABILITIES REQUIREMENT		• Interpret painting requirements.
		• Mix paint additives as per specification.
		• Carry out preparation which includes:
		  • surface preparation
		  • protection works such as masking/ patching
		• Maintain painting tools.
		• Apply painting technique which includes:
		  • brush
		  • roller
		  • airless spray
		• Perform painting work which includes:
		  • base coat
		  • intermediate coat
		  • finishing coat
		• Adhere to safety procedures.
		• Respond to unsafe conditions at work place.
			• Interpret Client requirements.
			• Inspect blasting works which include:
			  • type of blasting materials
			  • surface finish
			• Inspect painting preparation which includes:
			  • work piece surface temperature
			  • environment humidity
			• Inspect painting works which include:
			  • paint specification
			  • painting application
			  • painting thickness
			• Monitor adherence to safety procedures.
			• Conscious of unsafe conditions surrounding the work place.
			• Concern about sustainability and wastage.		

SKILL AREA	Onshore Facilities & Downstream Plants Skillsets in Turnaround Activities				
SKILLSET	**VALVE OVERHAULING**				
SKILL DESCRIPTION	Valve overhauling works describe the activities of restoration of valve through repair or replace of components to restore it to the intended function. It involves dismantling, components cleaning/inspection/replacement and re-assemble and testing of the valve. *[NOTE: Highlighted columns are for job in-demand. Personnel career development will start from the lowest level, moving upwards]*				
COMPETENCY DESCRIPTION	**LEVEL 1**	**LEVEL 2**	**LEVEL 3**	**LEVEL 4**	**LEVEL 5**
	Valve Overhauling Assistant	**Valve Overhauling Technician**	**Valve Overhauling Technician Foreman**	**Valve Overhauling Technician Supervisor**	**Valve Overhauling Superintendent**

KNOWLEDGE REQUIREMENT		• Types of valves design and application which includes:
		  • gate/ globe/ ball/ butterfly
		  • non-return valve (NRV)
		  • pressure safety valve (PSV)
		  • etc.
		• PSV bench test and calibration procedures.
		• Valves servicing procedures as Quality Control and ASME codes & standards.
		• Safe work practices which include:
		  • Working at Height
		  • Working in Confined Space
		  • Housekeeping at Workplace			

ABILITIES REQUIREMENT		• Interpret notification of valves defect.
		• Perform troubleshooting of valves.
		• Perform disassembly/repair/ assembly of valves which includes:
		  • gate/ globe/ ball/ butterfly
		  • non-return valve (NRV)
		  • pressure safety valve (PSV)
		  • etc.			

ABILITIES (CONTINUE)		• Perform testing and calibration of valves. • Prepare valve repair report. • Prepare PSV calibration certificate. • Adhere to safety procedures. • Respond to unsafe conditions at work place.			

SKILL AREA	Onshore Facilities & Downstream Plants Skillsets in Turnaround Activities				
SKILLSET	**ROTATING EQUIPMENT**				
SKILL DESCRIPTION	Rotating Equipment turnaround works describe the activities of overhauling, components cleaning/repair/replace, restore and testing the rotating equipment to its intended function. Reinstallation of the rotating equipment also involves alignment works and piping tie-ins. *[NOTE: Highlighted columns are for job in-demand. Personnel career development will start from the lowest level, moving upwards]*				
COMPETENCY DESCRIPTION	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
	Rotating Equipment Assistant	**Rotating Equipment Technician**	**Rotating Equipment Foreman**	**Rotating Equipment Supervisor**	**Rotating Equipment Superintendent**

KNOWLEDGE REQUIREMENT		• Types and application of pumps which includes:
		  • centrifugal (horizontal)
		  • centrifugal (vertical)
		  • plunger
		  • screw
		  • diaphragm
		• Overhaul procedures of single-stage centrifugal pump.
		• Overhaul procedures of positive displacement pump which includes:
		  • plunger
		  • diaphragm
		• Safe work practices which include:
		  • Working at Height
		  • Working in Confined Space
		  • Housekeeping at Workplace
			• Interpret pump defect notification.
			• Basic troubleshooting of pumps defect which includes:
			  • low/ no flow rate
			  • high/ low/ no pumping pressure
			  • high/ low running temperature
			• Overhaul procedures of multi-stage centrifugal pump.
			• Overhaul procedures of positive displacement pump which includes:
			  • screw
			  • rotary
			• Technical writing skill.
			• People managementPeople Management skill.
			• Interpersonal skill.
			• Communications skill.
			• 3R concept; Reduce, Reuse, Recycle.		

ABILITIES REQUIREMENT		• Types and application of pumps which includes:
		  • centrifugal (horizontal)
		  • centrifugal (vertical)
		  • plunger
		  • screw
		  • diaphragm
		• Overhaul procedures of single-stage centrifugal pump.
			• Interpret pump defect notification.
			• Basic troubleshooting of pumps defect which includes:
			  • low/ no flow rate
			  • high/ low/ no pumping pressure
			  • high/ low running temperature
			• Overhaul procedures of multi-stage centrifugal pump.
			• Overhaul procedures of positive displacement pump which includes:
			  • screw
			  • rotary		

COMPETENCY DESCRIPTION	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
	Rotating Equipment Assistant	**Rotating Equipment Technician**	**Rotating Equipment Foreman**	**Rotating Equipment Supervisor**	**Rotating Equipment Superintendent**

ABILITIES (CONTINUE)		• Overhaul procedures of positive displacement pump which includes:
		  • plunger
		  • diaphragm
		• Safe work practices which includes:
		  • Working at Height
		  • Working in Confined Space
		  • Housekeeping at Workplace
			• Hazard risk assessment and documentation which includes:
			  • Job Safety Analysis (JSA)
			  • Permit to Work (PTW)
			  • Toolbox Briefing
			• Prepare work schedule and manpower assignment.		

SKILL AREA	Onshore Facilities & Downstream Plants Skillsets in Turnaround Activities				
SKILLSET	**FLANGE MANAGEMENT**				
SKILL DESCRIPTION	Flange management works describe the activities of ensuring mechanical joint integrity of equipment nozzle or piping flanges to prevent from joint leakage. The job involves ensuring proper components used and tightening method employed in order to provide joint integrity assurance and leak-free operations. *[NOTE: Highlighted columns are for job in-demand. Personnel career development will start from the lowest level, moving upwards]*				
COMPETENCY DESCRIPTION	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
	Bolting Fitter	**Bolter**	**Bolting Foreman**	**Flange Management Inspector**	**Flange Management Superintendent**

KNOWLEDGE REQUIREMENT	• Types of flanges which include:
	  • flat-face
	  • raised-face
	  • ring-joint face
	  • lap-joint face
	  • male & female face
	  • tongue & groove face
	• Safe work practices which includes:
	  • Working at Height
	  • Working in Confined Space
	• Housekeeping at Workplace
		• Basic understanding of isometric drawing which includes:
		  • flange type
		  • gasket specifications
		  • bolts/ nuts specifications
		• Safe work practices which includes:
		  • Working at Height
		  • Working in Confined Space
		  • Housekeeping at Workplace
			• Basic understanding of P&ID drawing which includes:
			  • piping class/ specifications
			  • ASME relevant codes and standards
			• Technical writing skill.
			• People managementPeople Management skill.
			• Interpersonal skill.
			• Communications skill.
			• 3R concept; Reduce, Reuse, Recycle.
				• Basic understanding of drawings which includes:
				  • P&ID
				  • piping general arrangements
				  • piping isometric
				• Types of piping joint tightness defects.
				• Technical writing skill.
				• People managementPeople Management skill.
				• Interpersonal skill.
				• Communications skill.
				• 3R concept; Reduce, Reuse, Recycle.	

ABILITIES REQUIREMENT	• Interpret scope of work as per job instruction.
	• Check flanges parallelism.
	• Perform pre-tightening check which includes:
	  • flange faces
	  • gasket type
	  • stud-bolts/ nuts specifications
	• Apply molykote lubricant onto the stud-bolts and nuts.
	• Perform flange joint tightening technique which includes:
	  • manual torque wrench
	  • hydraulic torque wrench
	• Prepare joint tightening checklist.
	• Adhere to safety procedures.
	• Respond to unsafe conditions at work place.
		• Interpret piping isometric drawings.
		• Perform flange joint tightening technique which includes:
		  • manual torque wrench
		  • hydraulic torque wrench
		  • hydraulic bolt tensioning
		• Prepare joint completion certificate.
		• Adhere to safety procedures.
		• Respond to unsafe conditions at work place.
			• Interpret P&ID drawings.
			• Interpret torquing value.
			• Prepare work schedule and manpower assignment.
			• Verify flange joint tightness.
			• Monitor adherence to safety procedures.
			• Conscious of unsafe conditions surrounding the work place.
			• Hazard risk assessment and documentation which includes:
			  • Job Safety Analysis (JSA)
			  • Permit to Work (PTW)
			  • Toolbox Briefing
			• Prepare work schedule and manpower assignment.
				• Interpret P&ID, piping class and isometric drawings.
				• Inspect flange joint tightness which includes:
				  • flange visual conditions
				  • flange parallelism
				  • flange spacing/ gap
				  • bolts/ nut looseness
				  • uneven stud-bolts length
				  • gasket specifications
				  • tightening method/ specification
				• Monitor adherence to safety procedures.
				• Conscious of unsafe conditions surrounding the work place.
				• Concern about sustainability and wastage.	

SKILL AREA	Onshore Facilities & Downstream Plants Skillsets in Turnaround Activities				
SKILLSET	**RADIOGRAPHIC TESTING**				
SKILL DESCRIPTION	Radiographic testing (RT) works describe the activities of performing non-destructive examination (NDE) technique that involves the use of either gamma-rays or x-rays to view the internal structure of a component. In the oil & gas industry, RT is often used to inspect machinery, such as pressure vessels and piping, to detect for flaws. *[NOTE: Highlighted columns are for job in-demand. Personnel career development will start from the lowest level, moving upwards]*				
COMPETENCY DESCRIPTION	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
	Radiographic Testing Technician Level-1	**Radiographic Testing Technician Level-2**	**Radiographic Testing Supervisor**	**No Level**	**No Level**

KNOWLEDGE REQUIREMENT	• Malaysian regulations on handling and transporting radiographic testing materials.
	• Understanding of drawings which includes:
	  • Plot Plan
	  • General Arrangement
	  • Isometric drawing
	• Safe exposure limits as radiographic testing operator which includes:
	  • personal exposure monitoring badge
	  • safe exposure distant and duration
	• Radiographic testing operating practices which includes:
	  • strength of source
	  • thickness of material versus exposure time
	• Codes and standards for welding flaws and defects which includes:
	  • porosity
	  • slag intrusion
	  • undercut
	  • insufficient penetration
	• Safe work practices which includes:
	  • Working at Height
	  • Working in Confined Space
	  • Housekeeping at Workplace
		• Malaysian regulations on handling and transporting radiographic testing materials.
		• Setting up requirements for radiographic developing room.
		• Storage requirements of radiographic source.
		• Understanding limitations of radiographic testing method.
		• Prepare work schedule and manpower assignment.
		• Perform basic troubleshooting of radiographic testing equipment.
		• Technical writing skill.
		• People managementPeople Management skill.
		• Interpersonal skill.
		• Communications skill.
		• Safe work practices which includes:
		  • Working at Height
		  • Working in Confined Space
		  • Housekeeping at Workplace			

COMPETENCY DESCRIPTION	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5

ABILITIES (CONTINUE)	**Radiographic Testing Technician Level-1**
	• Interpret radiography testing scope of work.
	• Perform x-ray/ gamma ray radiography testing equipment periodic check.
	• Carryout x-ray/ gamma ray radiographic testing equipment inventory control.
	• Transport and store x-ray/ gamma ray radiographic testing equipment as per regulatory requirements.
	• Setup x-ray/ gamma ray radiographic testing which includes:
	  • locate test area
	  • cordon hazardous boundary
	  • identify equipment location
	• Conduct x-ray/ gamma ray radiography shoot of test piece which includes:
	  • tag joint for identification
	  • place radiography film
	  • place radiography source
	  • shoot based on source exposure time
	• Perform radiography film processing which includes:
	  • setup dark room
	  • automatic/ manual film processing
	• Interpret radiographic test result as per codes and standards.
	• Prepare radiographic test report.
	• Adhere to safety procedures.
	• Respond to unsafe conditions at work place.
		Radiographic Testing Technician Level-2
		• Interpret radiography testing scope of work against applicable Radiographic Testing Procedure.
		• Validate x-ray/ gamma ray radiography testing equipment periodic check.
		• Coordinate x-ray/ gamma ray radiographic testing equipment inventory replenishment.
		• Coordinate storage of x-ray/ gamma ray radiographic testing equipment with Client as per regulatory requirements.
		• Select and define the limitations and advantages of radiographic test method.
		• Provide x-ray/ gamma ray radiographic testing guidance.
		• Conduct x-ray/ gamma ray radiography shoot on test piece which includes:
		  • tag joint for identification
		  • place radiography film
		  • place radiography source
		  • shoot based on source exposure time
		• Verify interpretation of radiographic test result as per codes and standards.
		  • re-shoot, if necessary
		  • accept/ reject interpretation
		• Validate radiographic test report.
		• Present radiographic test result to Client.
		• Monitor adherence to safety procedures.
		• Conscious of unsafe conditions surrounding the work place.
		• Concern about sustainability and wastage.
			Radiographic Testing Supervisor	**No Level**	**No Level**

SKILL AREA	Onshore Facilities & Downstream Plants Skillsets in Turnaround Activities				
SKILLSET	**ULTRASONIC TESTING**				
SKILL DESCRIPTION	Ultrasonic testing (UT) works describe the activities of performing non-destructive examination (NDE) technique based on propagation of ultrasonic waves in the object or material tested. In the oil & gas industry, UT is often used to detect internal flaws or to perform thickness measurement, often to monitor pipework corrosion. *[NOTE: Highlighted columns are for job in-demand. Personnel career development will start from the lowest level, moving upwards]*				
COMPETENCY DESCRIPTION	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
	Ultrasonic Testing Technician Level-1	**Ultrasonic Testing Technician Level-2**	**Ultrasonic Testing Supervisor**	**No Level**	**No Level**

KNOWLEDGE REQUIREMENT	• Understanding of drawings which includes:
	  • Plot Plan
	  • General Arrangement
	  • Isometric drawing
	• Ultrasonic testing operating practices which includes:
	  • UT applications
	  • UT limitations
	• Codes and standards for welding flaws and defects which includes:
	  • welding defects
	  • thickness measurement
	• Safe work practices which includes:
	  • Working at Height
	  • Working in Confined Space
	  • Housekeeping at Workplace
		• Understanding limitations of ultrasonic testing method.
		• Prepare work schedule and manpower assignment.
		• Perform basic troubleshooting of ultrasonic testing equipment.
		• Technical writing skill.
		• People managementPeople Management skill.
		• Interpersonal skill.
		• Communications skill.
		• Safe work practices which includes:
		  • Working at Height
		  • Working in Confined Space
		  • Housekeeping at Workplace			

ABILITIES REQUIREMENT	• Interpret ultrasonic testing scope of work.
	• Perform ultrasonic testing equipment periodic check and calibration.
	• Carryout ultrasonic testing equipment inventory control.
	• Conduct ultrasonic testing on test piece which includes:
	  • prepare joint surface area
	  • apply gel on test piece
	  • perform thickness measurement ultrasonic testing
		• Select and define limitations and advantages of ultrasonic testing technique.
		• Validate ultrasonic testing equipment periodic check and calibration.
		• Coordinate ultrasonic testing inventory replenishment.
		• Provide ultrasonic testing guidance.			

COMPETENCY DESCRIPTION	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
ABILITIES (CONTINUE)	**Ultrasonic Testing Technician Level-1** • perform lamination ultrasonic testing • observe readings • Interpret ultrasonic test result as per codes and standards. • Prepare ultrasonic test report. • Adhere to safety procedures. • Respond to unsafe conditions at work place.	**Ultrasonic Testing Technician Level-2** • Conduct ultrasonic testing on test piece which includes: • groove plates • pipe and nozzle • T-K-Y weld joints • Perform ultrasonic testing interpretation and evaluation according to codes, standards, specifications and procedures. • Supervise ultrasonic testing of Technician Level-1. • Report the results of ultrasonic testing on welded construction. • Validate ultrasonic test report by Technician Level-1. • Present ultrasonic test result to Client. • Monitor adherence to safety procedures. • Conscious of unsafe conditions surrounding the work place. • Concern about sustainability and wastage.	**Ultrasonic Testing Supervisor**	**No Level**	**No Level**

SKILL AREA	Onshore Facilities & Downstream Plants Skillsets in Turnaround Activities				
SKILLSET	**EDDY CURRENT TESTING**				
SKILL DESCRIPTION	Eddy-current testing (ECT) works describe the activities of performing non-destructive examination (NDE) technique for conductive materials. In the oil & gas industry, ECT is often used to detect pitting, cracking and corrosion of tubes of coolers or exchangers. It can also be used to detect metal hardness and the thickness of non-conductive coating or metal parts such as paint. *[NOTE: Highlighted columns are for job in-demand. Personnel career development will start from the lowest level, moving upwards]*				
COMPETENCY DESCRIPTION	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
	Eddy Current Testing Technician Level-1	**Eddy Current Testing Technician Level-2**	**Eddy Current Testing Supervisor**	**No Level**	**No Level**

KNOWLEDGE REQUIREMENT	• Understanding of drawings which includes:
	  • Plot Plan
	  • General Arrangement
	  • Isometric drawing
	• Eddy current testing operating practices which includes:
	  • ECT applications
	  • ECT limitations
	• Codes and standards for welding flaws and defects which include:
	  • welding defects
	  • HEX tubes defects
	• Safe work practices which include:
	  • Working at Height
	  • Working in Confined Space
	  • Housekeeping at Workplace
		• Understanding limitations of eddy current testing method.
		• Prepare work schedule and manpower assignment.
		• Technical writing skill.
		• People managementPeople Management skill.
		• Interpersonal skill.
		• Communications skill.
		• Perform basic troubleshooting of eddy current testing equipment.
		• Safe work practices which includes:
		  • Working at Height
		  • Working in Confined Space
		  • Housekeeping at Workplace			

ABILITIES REQUIREMENT	• Interpret eddy current testing scope of work.
	• Perform eddy current testing equipment periodic check.
	• Carryout eddy current testing equipment inventory control.
	• Conduct eddy current testing on test piece which includes:
	  • prepare joint surface area
	  • conductivity inspection
	  • surface inspection
	  • thin material thickness measurement
		• Select and define limitations and advantages of eddy current testing technique.
		• Validate eddy current testing equipment periodic check and calibration.
		• Coordinate eddy current testing inventory replenishment.
		• Provide eddy current testing guidance.
		• Conduct eddy current testing on test piece which includes:
		• tubing inspection			

COMPETENCY DESCRIPTION	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
ABILITIES (CONTINUE)	**Eddy Current Testing Technician Level-1** • bolt hole inspection • observe readings • Interpret eddy current results as per codes and standards. • Prepare eddy current test report. • Adhere to safety procedures. • Respond to unsafe conditions at work place.	**Eddy Current Testing Technician Level-2** • Perform eddy current testing interpretation and evaluation according to codes, standards, specifications and procedures. • Supervise eddy current testing of Technician Level-1. • Validate eddy current test report by Technician Level-1. • Present eddy current test result to Client. • Monitor adherence to safety procedures. • Conscious of unsafe conditions surrounding the work place. • Concern about sustainability and wastage.	**Eddy Current Testing Supervisor**	**No Level**	**No Level**

SKILL AREA	Onshore Facilities & Downstream Plants Skillsets in Turnaround Activities				
SKILLSET	**DYE PENETRANT TESTING**				
SKILL DESCRIPTION	Dye penetrant testing (DPT) works describe the activities of performing non-destructive examination (NDE) technique widely used to detect surface breaking flaws such as cracks, porosity, laps, seams and other surface discontinuities. *[NOTE: Highlighted columns are for job in-demand. Personnel career development will start from the lowest level, moving upwards]*				
COMPETENCY DESCRIPTION	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
	Dye Penetrant Testing Technician Level-1	**Dye Penetrant Testing Technician Level-2**	**Dye Penetrant Testing Supervisor**	**No Level**	**No Level**

KNOWLEDGE REQUIREMENT	• Test piece preparation requirements which include:
	  • surface condition
	  • surface temperature
	• Understanding of drawings which includes:
	  • Plot Plan
	  • General Arrangement
	  • Isometric drawing
	• Codes and standards for welding flaws and defects.
		• Understanding limitations of dye penetrant testing method.
		• Prepare work schedule and manpower assignment.
		• Codes and standards for welding flaws and defects.
		• Technical writing skill.
		• People managementManagement skill.
		• Interpersonal skill.
		• Communications skill.			

ABILITIES REQUIREMENT	• Interpret dye penetrant testing scope of work.
	• Carry out dye penetrant testing equipment inventory control.
	• Conduct dye penetrant testing on test piece which includes:
	  • prepare joint surface area
	  • fluorescent and visible penetrant testing
	  • wet/ dry penetrant testing
	  • observe readings
	• Interpret dye penetrant test result as per codes and standards.
	• Prepare dye penetrant test report.
	• Adhere to safety procedures.
	• Respond to unsafe conditions at work place.
		• Select and define limitations and advantages of dye penetrant testing technique.
		• Coordinate dye penetrant testing inventory replenishment.
		• Provide dye penetrant testing guidance.
		• Perform dye penetrant testing interpretation and evaluation according to codes, standards, specifications and procedures.
		• Supervise dye penetrant testing of Technician Level-1.
		• Validate dye penetrant test report by Technician Level-1.
		• Present dye penetrant test result to Client.
		• Monitor adherence to safety procedures.
		• Conscious of unsafe conditions surrounding the work place.
		• Concern about sustainability and wastage.			

SKILL AREA	Onshore Facilities & Downstream Plants Skillsets in Turnaround Activities				
SKILLSET	**MAGNETIC PARTICLE TESTING**				
SKILL DESCRIPTION	Magnetic particle testing (MPT) works describe the activities of performing non-destructive examination (NDE) technique used to detect surface and slightly subsurface flaws in ferromagnetic materials such as iron, nickel, cobalt and some alloys. In the oil & gas industry, MPT is often used to detect surface breaking such as cracking, pores, cold laps, lack of sidewall fusion in welds. *[NOTE: Highlighted columns are for job in-demand. Personnel career development will start from the lowest level, moving upwards]*				
COMPETENCY DESCRIPTION	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
	Magnetic Particle Testing Technician Level 1	**Magnetic Particle Testing Technician Level 2**	**Magnetic Particle Testing Supervisor**	**No Level**	**No Level**

KNOWLEDGE REQUIREMENT	• Understanding of drawings which includes:
	  • Plot Plan
	  • General Arrangement
	  • Isometric drawing
	• Magnetic particle testing operating practices which include:
	  • MPT applications
	  • MPT limitations
	• Codes and standards for welding flaws and defects which include:
	  • welding defects
	• Safe work practices which include:
	  • Working at Height
	  • Working in Confined Space
	  • Housekeeping at Workplace
		• Understanding limitations of eddy current testing method.
		• Prepare work schedule and manpower assignment.
		• Perform basic troubleshooting of eddy current testing equipment.
		• Technical writing skill.
		• People managementManagement skill.
		• Interpersonal skill.
		• Communications skill.
		• Safe work practices which include:
		  • Working at Height
		  • Working in Confined Space
		  • Housekeeping at Workplace			

ABILITIES REQUIREMENT	• Interpret magnetic particle testing scope of work.
	• Perform magnetic particle testing equipment periodic check.
	• Carry out magnetic particle testing equipment inventory control.
	• Conduct magnetic particle on test piece which includes:
	  • prepare joint surface area
	  • fluorescent and visible testing
	  • wet/ dry magnetic particle testing
	  • observe readings
	• Interpret magnetic particle result as per codes and standards.
		• Select and define limitations and advantages of magnetic particle testing technique.
		• Validate magnetic particle testing equipment periodic check and calibration.
		• Coordinate magnetic particle testing equipment inventory replenishment.
		• Provide magnetic particle testing guidance.
		• Perform magnetic particle testing interpretation and evaluation according to codes, standards, specifications and procedures.			

COMPETENCY DESCRIPTION	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
ABILITIES (CONTINUE)	**Magnetic Particle Testing Technician Level 1** • Prepare magnetic particle test report. • Adhere to safety procedures. • Respond to unsafe conditions at work place.	**Magnetic Particle Testing Technician Level 2** • Supervise magnetic particle testing of Technician Level-1. • Present magnetic particle test result to Client. • Monitor adherence to safety procedures. • Conscious of unsafe conditions surrounding the work place. • Concern about sustainability and wastage.	**Magnetic Particle Testing Supervisor**	**No Level**	**No Level**

SKILL AREA	Onshore Facilities & Downstream Plants Skillsets in Turnaround Activities				
SKILLSET	**ELECTRICAL**				
SKILL DESCRIPTION	Electrical maintenance works describe the activities of fault diagnosis, routine servicing and maintenance of electrical equipment or components, electrical system as well as laying and termination of electrical cabling works. *[NOTE: Highlighted columns are for job in-demand. Personnel career development will start from the lowest level, moving upwards]*				
COMPETENCY DESCRIPTION	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
	No Level	**Wireman**	**Electrical Technician**	**Electrical Chargeman**	**Electrical Superintendent**

KNOWLEDGE REQUIREMENT		• Understand single-line diagram.
		• Safe work practices which include:
		  • Working at Height
		  • Working in Confined Space
		  • Housekeeping at Workplace
			• Electricity fundamentals and physics.
			• Process, electrical equipment and electrical drawings.
			• Megger Test procedures and acceptable limits.
			• Lock-Out, Tag-Out (LOTO) rules and procedures.
			• Hazards, electrical risk and safety at work.
			• Protections layers concept.
			• Technical writing skill.
			• People managementManagement skill.
			• Interpersonal skill.
			• Communications skill.
			• 3R concept; Reduce, Reuse, Recycle.		

ABILITIES REQUIREMENT		• Interpret wiring diagram and electrical circuit. • Carry out installation and repair of electrical wiring. • Perform electrical wiring continuity check. • Adhere to safety procedures. • Respond to unsafe conditions at work place.	• Interpret scope of electrical equipment defect. • Repair/ replace electrical equipment component. • Conduct electrical motor megger test. • Carry out motor overhauling work. • Coordinate motor stator rewinding works. • Prepare motor overhauling report. • Monitor adherence to safety procedures. • Conscious of unsafe conditions surrounding the work place. • Concern about sustainability and wastage.		

SKILL AREA	Onshore Facilities & Downstream Plants Skillsets in Turnaround Activities				
SKILLSET	**FIELD INSTRUMENTATION**				
SKILL DESCRIPTION	Field instrumentation maintenance works describe the activities of fault diagnosis, routine servicing and maintenance of process control instrumentations such as levels, flow, pressure, temperature, pH and humidity. In the oil & gas industry, Ex rated equipment and components are used based on the hazardous area classification requirements. *[NOTE: Highlighted columns are for job in-demand. Personnel career development will start from the lowest level, moving upwards]*				
COMPETENCY DESCRIPTION	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
	No Level	**Field Instrument Fitter**	**Field Instrument Technician**	**Field Instrument Inspector**	**Field Instrument Superintendent**

KNOWLEDGE REQUIREMENT		• Knowledge in instrumentation and control.
		• Basic knowledge of hazardous area classification and explosion- proof requirements.
		• Safe work practices which include:
		  • Working at Height
		  • Working in Confined Space
		  • Housekeeping at Workplace
			• Knowledge in instrumentation, process control and safeguarding.
			• Basic troubleshooting of instrument problems.
			• Technical writing skill.
			• People managementManagement skill.
			• Interpersonal skill.
			• Communications skill.
			• 3R concept; Reduce, Reuse, Recycle.
				• Basic area classification and gas groups.
				• Understanding of Hazardous Area Classification.
				• Understanding types of glands and fittings.
				• Understanding Ingress Protection (IP) types and application.
				• Technical writing skill.
				• People managementManagement skill.
				• Interpersonal skill.
				• Communications skill.	

ABILITIES REQUIREMENT		• Interpret scope of work.
		• Remove/ install field transmitter, including instrument tubing.
		• Remove/ install control valve, including actuator and instrument air tubing.
		• Repair field transmitter in loop test/ on bench.
		• Repair control valve in loop test/ on bench.
		• Lay and terminate instrument cable.
		• Install small-bore process piping/ instrument tubing.
		• Record removal, installation, calibration and testing work in check sheet.
		• Install and inspect instrument junction box.
		• Adhere to safety procedures.
		• Respond to unsafe conditions at work place.
			• Conduct inspection of instrument assembly and tubing connections for mechanical joint integrity.
			• Perform troubleshooting of instrument and control loop problem.
			• Verify laying of instrument cable.
			• Verify calibration and testing of instrument fixtures which include:
			  • control valves
			  • transmitters
			• Inspect instrument junction box.
			• Monitor adherence to safety procedures.
			• Conscious of unsafe conditions surrounding the work place.
			• Concern about sustainability and wastage.
				• Inspect field instrumentation and control which includes:
				  • gauges
				  • transmitters
				  • thermocouples
				  • orifice and connections
				• Inspect wiring/ cabling and cable glanding.
				• Check equipment protection level which includes:
				  • Flameproof: Ex(d)
				  • Non Sparking Ex(n)
				  • Intrinsically Safe: Ex(i)
				  • Increased Safety: Ex(e)
				• Inspect types and application of Ingress Protection (IP) equipment.
				• Check safety markings and signage.signage.	

SKILL AREA	Onshore Facilities & Downstream Plants Skillsets in Turnaround Activities				
SKILLSET	**SAFEGUARDING SYSTEM (SGS) INSTRUMENTATION**				
SKILL DESCRIPTION	Safeguarding system (SGS) instrumentation maintenance works describe the activities of fault diagnosis, routine servicing and maintenance of process protection system against uncontrolled loss of containment of hazardous materials. In the oil & gas industry, Ex rated equipment and components are used based on the hazardous area classification requirements. *[NOTE: Highlighted columns are for job in-demand. Personnel career development will start from the lowest level, moving upwards]*				
COMPETENCY DESCRIPTION	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
	No Level	**SGS Instrumentation Fitter**	**SGS Instrumentation Technician**	**SGS Instrumentation Supervisor**	**SGS Instrumentation Superintendent**
KNOWLEDGE REQUIREMENT			• Knowledge in instrumentation, process control and safeguarding. • Knowledge in Cause & Effect Matrix. • Basic troubleshooting of safeguarding and IPF. • Technical writing skill. • People managementManagement skill. • Interpersonal skill. • Communications skill. • 3R concept; Reduce, Reuse, Recycle.		
ABILITIES REQUIREMENT			• Verify repair of SGS system components. • Perform troubleshooting of safeguarding/ IPF systems. • Perform testing/ commissioning of SGS/ PLC. • Translate Cause & Effect Matrix into safeguarding logic. • Monitor adherence to safety procedures. • Conscious of unsafe conditions surrounding the work place. • Concern about sustainability and wastage.		

SKILL AREA	Onshore Facilities & Downstream Plants Skillsets in Turnaround Activities				
SKILLSET	**DISTRIBUTED CONTROL SYSTEM (DCS) INSTRUMENTATION**				
SKILL DESCRIPTION	Distributed control system (DCS) instrumentation maintenance works describe the activities of fault diagnosis, routine servicing and maintenance of process control loops to integrate various plant systems for visualisation, registration and reporting of these processes. In the oil & gas industry, Ex rated equipment and components are used based on the hazardous area classification requirements. *[NOTE: Highlighted columns are for job in-demand. Personnel career development will start from the lowest level, moving upwards]*				
COMPETENCY DESCRIPTION	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
	No Level	**DCS Instrumentation Fitter**	**DCS Instrumentation Technician**	**DCS Instrumentation Supervisor**	**DCS Instrumentation Superintendent**
KNOWLEDGE REQUIREMENT			• Knowledge in instrumentation, process control and safeguarding. • Basic troubleshooting of DCS problems. • Technical writing skill. • People managementManagement skill. • Interpersonal skill. • Communications skill. • 3R concept; Reduce, Reuse, Recycle.		
ABILITIES REQUIREMENT			• Verify repair of DCS components. • Perform basic troubleshooting of DCS. • Perform testing/ commissioning of SGS/ PLC. • Translate basic design of DCS into switching logic and process control loops. • Monitor adherence to safety procedures. • Conscious of unsafe conditions surrounding the work place. • Concern about sustainability and wastage.		

SKILL AREA	Onshore Facilities & Downstream Plants Skillsets in Turnaround Activities				
SKILLSET	**QUALITY MEASURING INSTRUMENTS (QMI)**				
SKILL DESCRIPTION	Quality measuring instruments (QMI) maintenance works describe the activities of fault diagnosis, routine servicing and maintenance of QMI equipment such as flow meters for process or custody measurements of process flows. In the oil & gas industry, Ex rated equipment and components are used based on the hazardous area classification requirements. *[NOTE: Highlighted columns are for job in-demand. Personnel career development will start from the lowest level, moving upwards]*				
COMPETENCY DESCRIPTION	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
	No Level	**QMI Fitter**	**QMI Technician**	**QMI Supervisor**	**QMI Superintendent**

KNOWLEDGE REQUIREMENT		• Knowledge in quality measuring instrument.
		• Basic knowledge of hazardous area classification and explosion- proof requirements.
		• Safe work practices which include:
		  • Working at Height
		  • Working in Confined Space
		  • Housekeeping at Workplace
			• Principal knowledge in QMI which includes:
			  • analysers
			  • monitors
			  • chromatographs
			• Basic troubleshooting of QMI problems.
			• Understand regulatory requirements on custody transfer meters.
			• Technical writing skill.
			• People managementManagement skill.
			• Interpersonal skill.
			• Communications skill.
			• 3R concept; Reduce, Reuse, Recycle.		

ABILITIES REQUIREMENT		• Interpret scope of work. • Repair/ replace QMI components. • Carry out testing of QMI components. • Prepare documents, manuals, procedures, drawings for QMI systems. • Adhere to safety procedures. • Respond to unsafe conditions at work place.	• Verify repair of QMI components. • Perform basic troubleshooting of QMI. • Perform testing/ commissioning of QMI equipment. • Coordinate calibration of custody transfer meters to regulatory requirements. • Monitor adherence to safety procedures. • Conscious of unsafe conditions surrounding the work place. • Concern about sustainability and wastage.		

Skills & Description of Competencies

Onshore Facilities & Downstream Plant Skillsets in Projects Activities

Skillsets:

- Structure Welding
- Pipe Welding
- Pipe Fitting
- Rigging & Slinging
- Scaffolding
- Insulation
- Refractory
- Blasting & Painting
- Rotating Equipment
- Flange Management
- Radiographic Testing
- Ultrasonic Testing
- Eddy Current Testing
- Dye Penetrant Testing
- Magnetic Particle Testing
- Electrical
- Field Instrumentation
- Quality Measuring Instruments (QMI)

SKILL AREA	Onshore Facilities & Downstream Plants Skillsets in Project Activities				
SKILLSET	STRUCTURE WELDING				
SKILL DESCRIPTION	Structural welding works describe the activities of jointing two pieces of plates or structural materials. The job involves various welding technique to fuse plates and structural materials such as beams, columns, rods and other fixtures to form a complete or part of structure or metalwork. *[NOTE: Highlighted columns are for job in-demand. Personnel career development will start from the lowest level, moving upwards]*				
COMPETENCY DESCRIPTION	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
	Welding Assistant	**Structural Welder**	**Structural Welding Foreman**	**Welding Supervisor**	**Welding Superintendent**

KNOWLEDGE REQUIREMENT		• Types of construction drawings which include:
		  • Plan view, Cross-sectional drawings;
		  • Shop drawings.
		• Types of welding technique and its application which include:
		  • Shielded Metal Arc Welding (SMAW)
		  • Gas Metal Arc Welding (GMAW)
		  • Flux Core Arc Welding (FCAW)
		  • Submerged Arc Welding (SAW)
		• Safe work practices which include:
		  • Working at Height
		  • Working in Confined Space
		  • Housekeeping at Workplace
			• Welding Practice document which includes:
			  • Welding Qualification Test (WQT)
			  • Welding Procedure Specification (WPS)
			  • Procedure Qualification Record (PQR)
			• Types of welding defects which include:
			  • Cracks
			  • Undercutting
			  • Slag/flux inclusion
			• Types of welding Non-Destructive Testing (NDT) which include:
			  • Dye Penetrant Test (DPT)
			  • Radiography Test (RT)
			  • Magnetic Particle Test (MPT)
			  • Ultrasonic Test (UT)
			• Hazard risk assessment and documentation which includes:
			  • Job Safety Analysis (JSA)
			  • Permit to Work (PTW)
			  • Toolbox Briefing
			• Prepare work schedule and manpower assignment.
			• Technical writing skill.
			• People managementManagement skill.
			• Interpersonal skill.
			• Communications skill.
			• 3R concept; Reduce, Reuse, Recycle.		

COMPETENCY DESCRIPTION	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
	Welding Assistant	**Structural Welder**	**Structural Welding Foreman**	**Welding Supervisor**	**Welding Superintendent**

ABILITIES (CONTINUE)		• Calibrate welding tools and equipment as per parameters listed in the Welding Procedure Specification (WPS).
		• Secure and fasten structural components using clamps, braces, jacks and bolt straps.
		• Carry out post-welding treatment of structures by cleaning, buffing and polishing finished workpieces.
		• Utilise manual and mechanical processes to weld in various positions.
		• Carry out fillet, tack and full penetration welding on structural joints.
		• Perform welding techniques which include:
		  • Shielded Metal Arc Welding (SMAW)
		  • Gas Metal Arc Welding (GMAW)
		  • Flux Core Arc Welding (FCAW)
		  • Submerged Arc Welding (SAW)
		• Perform chipping and cleaning between weld layers.
		• Perform initial visual inspection after completion of welds.
		• Adhere to safety procedures.
		• Respond to unsafe conditions at work place.
			• Interpret Welding Procedure Specification (WPS).
			• Analyse structural drawings to lay out the framework of a structure for joint design and configuration.
			• Inspect and evaluate welds to ensure they are free of defects and conform to specifications.
			• Conduct estimates to determine the bill of quantities of materials required for a welding project.
			• Employ appropriate welding methods in completing structural fabrications.
			• Coordinate Non-Destructive Testing (NDT) and Destructive Test (DT) for finished weld-joints.
			• Identify and initiate repair of weld defects.
			• Prepare work schedule and manpower assignment.
			• Perform supervisory function on welding and cutting techniques which include:
			  • Shielded Metal Arc Welding (SMAW)
			  • Gas Metal Arc Welding (GMAW)
			  • Flux Core Arc Welding (FCAW)
			  • Submerged Arc Welding (SAW)
			• Perform audit on welders in accordance with standard operating procedure.
			• Monitor adherence to safety procedures.
			• Conscious of unsafe conditions surrounding the work place.
			• Concern about sustainability and wastage.		

SKILL AREA	**Onshore Facilities & Downstream Plants Skillsets in Project Activities**
SKILLSET	**PIPE WELDING**
SKILL DESCRIPTION	Pipe welding works describe the activities of jointing two pieces of pipes or pipe fittings. The job involves various welding technique to fuse pipes and fittings such as elbows, reducers, flanges, valves and other fittings materials to form a complete or spool piece of piping or pipeline. *[NOTE: Highlighted columns are for job in-demand. Personnel career development will start from the lowest level, moving upwards]*

COMPETENCY DESCRIPTION	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
	Welding Assistant	**Piping Welder**	**Piping Welding Foreman**	**Welding Supervisor**	**Welding Superintendent**

KNOWLEDGE REQUIREMENT		• Types of construction drawings which include:
		  • Piping plan
		  • Isometric drawings
		• Types of welding technique and its application which include:
		  • Shielded Metal Arc Welding (SMAW)
		  • Gas Metal Arc Welding (GMAW)
		  • Flux Core Arc Welding (FCAW)
		  • Submerged Arc Welding (SAW)
		• Safe work practices which include:
		  • Working at Height
		  • Working in Confined Space
		  • Housekeeping at Workplace
			• Welding Practice document which includes:
			  • Welding Qualification Test (WQT)
			  • Welding Procedure Specification (WPS)
			  • Procedure Qualification Record (PQR)
			• Welding map.
			• Types of welding defects which include:
			  • Cracks
			  • Undercutting
			  • Slag/flux inclusion
			• Types of welding Non-Destructive Testing (NDT) which include:
			  • Dye Penetrant Test (DPT)
			  • Radiography Test (RT)
			  • Magnetic Particle Test (MPT)
			  • Ultrasonic Test (UT)
			• Hazard risk assessment and documentation which include:
			  • Job Safety Analysis (JSA)
			  • Permit to Work (PTW)
			  • Toolbox Briefing
			• Prepare work schedule and manpower assignment.
			• Technical writing skill.
			• People managementManagement skill.
			• Interpersonal skill.
			• Communications skill.
			• 3R concept; Reduce, Reuse, Recycle.		

COMPETENCY DESCRIPTION	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
	Welding Assistant	**Piping Welder**	**Piping Welding Foreman**	**Welding Supervisor**	**Welding Superintendent**

ABILITIES (CONTINUE)		• Interpret Welding Map.
		• Calibrate welding tools and equipment as per parameters listed in the Welding Procedure Specification (WPS).
		• Secure and fasten pipes & fittings components using clamps, braces, jacks and bolt straps.
		• Carry out post-welding treatment of pipes & fittings by cleaning, buffing and polishing finished workpieces.
		• Utilise manual and mechanical processes to weld in various positions.
		• Perform current adjustment prior to welding.
		• Carry out fillet, tack and full penetration welding on pipes & fittings joints.
		• Perform welding techniques which include:
		  • Shielded Metal Arc Welding (SMAW)
		  • Gas Tungsten Arc Welding (GTAW)
		  • Gas Metal Arc Welding (GMAW)
		  • Flux Core Arc Welding (FCAW)
		  • Submerged Arc Welding (SAW)
		• Perform chipping and cleaning between weld layers.
		• Perform initial visual inspection after completion of welds.
		• Adhere to safety procedures.
		• Respond to unsafe conditions at work place.
			• Prepare Welding Map.
			• Interpret Welding Procedure Specification (WPS).
			• Analyse piping drawings to lay out the pipes & fittings for joint design and configuration.
			• Inspect and evaluate welds to ensure they are free of defects and conform to specifications.
			• Conduct estimates to determine the bill of quantities of materials required for a welding project.
			• Employ appropriate welding methods in completing pipes & fittings fabrications.
			• Coordinate Non-Destructive Testing (NDT) and Destructive Test (DT) for finished weld-joints.
			• Identify and initiate repair of weld defects.
			• Prepare work schedule and manpower assignment.
			• Perform supervisory function on welding and cutting techniques which includes:
			  • Shielded Metal Arc Welding (SMAW)
			  • Gas Tungsten Arc Welding (GTAW)
			  • Gas Metal Arc Welding (GMAW)
			  • Flux Core Arc Welding (FCAW)
			  • Submerged Arc Welding (SAW)
			• Perform audit on welders in accordance with standard operating procedure.
			• Monitor adherence to safety procedures.
			• Conscious of unsafe conditions surrounding the work place.
			• Concern about sustainability and wastage.		

SKILL AREA	Onshore Facilities & Downstream Plants Skillsets in Project Activities				
SKILLSET	PIPE FITTING				
SKILL DESCRIPTION	Pipe fitting works describe the activities of fabrication of piping and pipelines. The job involves cutting, grinding, fit-up and assembly of pipes and fittings such as elbows, reducers, flanges and other fittings materials to form a complete or spool piece of piping or pipeline. *[NOTE: Highlighted columns are for job in-demand. Personnel career development will start from the lowest level, moving upwards]*				
COMPETENCY DESCRIPTION	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
	Pipe Fitting Assistant	**Pipe Fitter**	**Pipe Fitting Foreman**	**Pipe Fitting Supervisor**	**Pipe Fitting Superintendent**

KNOWLEDGE REQUIREMENT		• Types of construction drawings which include:
		  • Piping plan
		  • Isometric drawings
		• Safe work practices which include:
		  • Working at Height
		  • Working in Confined Space
		  • Housekeeping at Workplace
			• Knowledge on Welding Map.
			• Hazard risk assessment and documentation which include:
			  • Job Safety Analysis (JSA)
			  • Permit to Work (PTW)
			  • Toolbox Briefing
			• Prepare work schedule and manpower assignment.
			• Technical writing skill.
			• People managementManagement skill.
			• Interpersonal skill.
			• Communications skill.
			• 3R concept; Reduce, Reuse, Recycle.		

ABILITIES REQUIREMENT		• Measure and marking of pipes for cutting. • Perform cutting, threading or hammering pipe to specification. • Perform oxy-cutting of pipe spools. • Perform grinding and fit-up of piping joints for welding. • Assemble pipes, tube fittings and related equipment. • Perform chipping & cleaning for finished work piece. • Perform fitting and assembly of work piece. • Adhere to safety procedures. • Respond to unsafe conditions at work place.	• Interpret piping drawings. • Perform calculation for dimensional work. • Inspect and test installed piping system. • Plan piping system layout, installation or repair works. • Prepare written materials (e.g. work orders, requisitions, drawings, sketches, etc.). • Perform complex fit-up and assembly. • Prepare work schedule and manpower assignment. • Monitor adherence to safety procedures. • Conscious of unsafe conditions surrounding the work place. • Concern about sustainability and wastage.		

SKILL AREA	Onshore Facilities & Downstream Plants Skillsets in Project Activities				
SKILLSET	RIGGING & SLINGING				
SKILL DESCRIPTION	Rigging and slinging works describe the activities of lifting and moving heavy loads with ropes, webbing, chains and other mechanical devices such as winches, chain-blocks, pull-lifts and other hoisting equipment. The job involves handling of lifting tools such as eye-bolts, shackles, wire slings and other mechanical lifting devices to perform a safe rigging and slinging works. *[NOTE: Highlighted columns are for job in-demand. Personnel career development will start from the lowest level, moving upwards]*				
COMPETENCY DESCRIPTION	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
	Rigging Assistant	**Rigger**	**Rigging Foreman**	**Rigging Supervisor**	**Rigging Superintendent**

KNOWLEDGE REQUIREMENT		• Types of lifting and slinging equipment which include:
		  • Eye-bolts and shackles.
		  • Webbing, wire ropes, chain slings.
		  • Winches, chain blocks/ pull- lifts.
		• Safe work practices which include:
		  • Working at Height
		  • Working in Confined Space
		  • Housekeeping at Workplace
			• Types of lifting equipment defects which include:
			  • Pitting and corrosion.
			  • Necking.
			• Weight estimation technique.
			• Technical writing skill.
			• People managementManage-ment skill.
			• Interpersonal skill.
			• Communications skill.
			• 3R concept; Reduce, Reuse, Recycle.
				• Lifting plan and procedures.
				• Load test procedures and requirements which include:
				  • Dead weight load
				  • Safe Working Load (SWL)
				• Technical writing skill.
				• People managementManage-ment skill.
				• Interpersonal skill.
				• Communications skill.
				• 3R concept; Reduce, Reuse, Recycle.	

ABILITIES REQUIREMENT		• Inspect and maintain slinging equipment and accessories.
		• Carry out periodic load-test of listing equipment.
		• Analyse objects to be lifted, shape and weight distribution.
		• Select suitable slinging equipment.
		• Record use of lifting and slinging equipment.
			• Verify lifting equipment fit for use.
			• Organise load test.
			• Interpret lifting procedure.
			• Develop lifting equipment inspection schedule.
			• Develop lifting equipment inspection checklist.
			• Carry out inspection of minor lifting equipment.
			• Prepare work schedule and manpower assignment.
			• Monitor adherence to safety procedures.
			• Conscious of unsafe conditions surrounding the work place.
			• Concern about sustainability and wastage.
				• Prepare lifting procedure.
				• Prepare lifting plan.
				• Supervise rigging operation.
				• Carry out inspection of major lifting equipment.
				• Verify inspection of equipment.
				• Coordinate DOSH visit for PMA equipment.
				• Hazard risk assessment and documentation which include:
				  • Job Safety Analysis (JSA)
				  • Permit to Work (PTW)
				  • Toolbox Briefing
				• Prepare work schedule and manpower assignment.	

SKILL AREA	Onshore Facilities & Downstream Plants Skillsets in Project Activities				
SKILLSET	RIGGING & SLINGING				
SKILL DESCRIPTION	Rigging and slinging works describe the activities of lifting and moving heavy loads with ropes, webbing, chains and other lifting mechanism. The job involves operating of mobile cranes of different safe working load capacity to lift and sling the lifted object across an area of lift radius. *[NOTE: Highlighted columns are for job in-demand. Personnel career development will start from the lowest level, moving upwards]*				
COMPETENCY DESCRIPTION	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
	No Level	**Signalman**	**Crane Operator**	**No Level**	**No Level**

KNOWLEDGE REQUIREMENT			• Knowledge on estimation of load weight and centre of gravity (CG).
			• Crane Load Chart
			  • boom length versus lifting capacity
			  • with/ without outrigger fully extended
			• Safe work practices which include:
			  • soft-ground
			  • underground cables or piping
			  • swing activities over human or equipment		

ABILITIES REQUIREMENT			• Ensure stability of crane and extension of outrigger on hard, flat surface. • Observe balance of lifting load by initial lift. • Inspect hoisting equipment such as sling-wire, shackles, crane wire-rope, hook, etc. • Carry out lifting of objects; ensure safe operation of lift. • Plan swing direction of load. • Interpret lifting signal by signalman or foreman.		

SKILL AREA	Onshore Facilities & Downstream Plants Skillsets in Project Activities				
SKILLSET	SCAFFOLDING				
SKILL DESCRIPTION	Scaffolding works describe the activities of erecting and dismantling of tubular-type or modular-type structure for falsework, access and/or working platform. *[NOTE: Highlighted columns are for job in-demand. Personnel career development will start from the lowest level, moving upwards]*				
COMPETENCY DESCRIPTION	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
	Level-1 Scaffolder	**Level-2 Scaffolder**	**Scaffolding Supervisor**	**Scaffolding Inspector**	**No Level**

KNOWLEDGE REQUIREMENT	• Basic components of metal scaffolding which include:
	  • tubes
	  • couplers
	  • boards/ decking
	• Fall protection.
	• Safe work practices which include:
	  • Working at Height
	  • Working in Confined Space
	  • Housekeeping at Workplace
		• Types of scaffolding which include:
		  • single scaffolding
		  • double scaffolding
		  • tubular scaffolding
		  • cantilever scaffolding
		• Fall protection.
		• Safe work practices which include:
		  • Working at Height
		  • Working in Confined Space
		  • Housekeeping at Workplace
			• Scaffold Standards:
			  • MS 1462 Metal Scaffolding
			  • BS 1139 Metal Scaffolding
			• Basic types of scaffolds which i include:
			  • supported scaffolds
			  • suspended scaffolds
			• Technical writing skill.
			• People managementManage-ment skill.
			• Interpersonal skill.
			• Communications skill.
			• 3R concept; Reduce, Reuse, Recycle.
				• Scaffold Standards:
				  • MS 1462 Metal Scaffolding
				  • BS 1139 Metal Scaffolding
				• Technical writing skill.
				• People managementManage-ment skill.
				• Interpersonal skill.
				• Communications skill.
				• 3R concept; Reduce, Reuse, Recycle.	

ABILITIES REQUIREMENT	• Check fit-for-use of scaffolding materials and accessories.
	• Interpret scaffolding drawing.
	• Construct scaffolding which include:
	  • static tower scaffolding
	  • independent scaffolding
	  • bird cage scaffolding
	  • putlog scaffolding
	  • trestle scaffolding
	• Maintain scaffolding fittings.
	• Adhere to safety procedures
		• Check fit-for-use of scaffolding materials and accessories.
		• Interpret scaffolding drawing.
		• Construct scaffolding which include:
		  • mobile tower scaffolding
		  • cantilever scaffolding
		  • suspended scaffolding
		  • truss-out (spur) scaffolding
		  • truck access/ gantry scaf-folding
		  • slung scaffolding
		  • shoring system
		  • false work
		  • flying shore
		  • raking shore
		• Maintain scaffolding fittings.
		• Respond to unsafe conditions at work place.
			• Conduct hazard risk assess-ment which includes:
			  • Job Method Statement (JMS)
			  • Job Safety Analysis (JSA)
			  • Permit to Work (PTW)
			  • Toolbox Briefing
			• Perform work planning and scheduling which include:
			  • materials and consumables planning
			  • tools and equipment opti-misation
			  • manpower assignment
				• Interpret use of scaffolding which includes:
				  • falsework
				  • access platform
				  • working platform
				• Inspect scaffolding fit-for-use.
				• Assess scaffolding fitness periodically; after strong wind, heavy downpour, modifications made, expiry date.
				• Monitor adherence to safety procedures.
				• Conscious of unsafe conditions surrounding the work place.
				• Concern about sustainability and wastage.	

SKILL AREA	Onshore Facilities & Downstream Plants Skillsets in Project Activities				
SKILLSET	INSULATION				
SKILL DESCRIPTION	Insulation works describe the activities of applying insulation materials to piping or process equipment or other mechanical systems in order to help control and maintain temperature; such as application of rockwool or calcium silicate and aluminium sheet protection for weather or contact damage. *[NOTE: Highlighted columns are for job in-demand. Personnel career development will start from the lowest level, moving upwards]*				
COMPETENCY DESCRIPTION	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
	Insulation Assistant	**Insulator**	**Insulation Foreman**	**Insulation Supervisor**	**Insulation Superintendent**

KNOWLEDGE REQUIREMENT		• Basic principle of insulation.
		• Safe work practices which include:
		  • Working at Height
		  • Working in Confined Space
		  • Housekeeping at Workplace
			• Types of cold insulation.
			• Types of hot insulation which include:
			  • rockwool
			  • calcium silicate
			• Technical writing skill.
			• People managementManagement skill.
			• Interpersonal skill.
			• Communications skill
			• 3R concept; Reduce, Reuse, Recycle.		

ABILITIES REQUIREMENT		• Interpret structural and piping drawings.
		• Measure and cut insulation materials for covering surface.
		• Carry out pre-forming of insulation cladding.
		• Perform insulation installation on piping, equipment or structures.
		• Remove and seal-off old insulation.
		• Adhere to safety procedures.
		• Response to unsafe conditions at work place.
			• Calculate requirements of insulation materials which includes:
			  • rockwool material
			  • cladding material
			• Prepare work schedule and manpower assignment.
			• Monitor adherence to safety procedures.
			• Conscious of unsafe conditions surrounding the work place.
			• Concern about sustainability and wastage.
			• Hazard risk assessment and documentation which include:
			  • Job Safety Analysis (JSA)
			  • Permit to Work (PTW)
			  • Toolbox Briefing		

SKILL AREA	Onshore Facilities & Downstream Plants Skillsets in Project Activities				
SKILLSET	REFRACTORY				
SKILL DESCRIPTION	Refractory works describe the activities of applying refractory materials to high temperature process equipment or other mechanical systems in order to help insulation of high temperature in process equipment or to protect the high temperature from damaging the metal parts of the equipment; such as application of bricks or casting of mortar over the parts to be protected. *[NOTE: Highlighted columns are for job in-demand. Personnel career development will start from the lowest level, moving upwards]*				
COMPETENCY DESCRIPTION	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
	Refractory Assistant	**Refractory Applicator**	**Refractory Supervisor**	**No Level**	**No Level**

KNOWLEDGE REQUIREMENT		• Basic principles of refractory which include:
		  • casting
		  • pump casting
		  • gunite
		  • shotcrete
		• Safe work practices which include:
		  • Working at Height
		  • Working in Confined Space
		  • Housekeeping at Workplace
			• Refractory construction drawings which include:
			  • wall tubes
			  • burner throat
			• Types of refractory: applications and limitations.
			• Technical writing skill.
			• People managementManagement skill.
			• Interpersonal skill.
			• Communications skill.
			• 3R concept; Reduce, Reuse, Recycle.		

ABILITIES REQUIREMENT		• Interpret structural and piping drawings.
		• Perform refractory application which includes:
		  • casting
		  • pump casting
		  • gunite
		  • shotcrete
		• Maintenance and testing of refractories application tools and equipment.
		• Adhere to safety procedures.
		• Respond to unsafe conditions at work place.
			• Types of refractory materials and their applications which include:
			  • fireclay refractory
			  • silica brick refractory
			  • high alumina refractory
			• Hazard risk assessment which includes:
			  • Job Method Statement (JMS)
			  • Job Safety Analysis (JSA)
			  • Permit to Work (PTW)
			  • Toolbox Briefing
			• Prepare work schedule and manpower assignment.		

SKILL AREA	Onshore Facilities & Downstream Plants Skillsets in Project Activities				
SKILLSET	BLASTING & PAINTING				
SKILL DESCRIPTION	Blasting & painting works describe the activities of surfaces preparation and coating application of structures or piping or equipment to a defined standard for protection of the surface from rust or corrosion damage due to exposure to the environment. *[NOTE: Highlighted columns are for job in-demand. Personnel career development will start from the lowest level, moving upwards]*				
COMPETENCY DESCRIPTION	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
	Blaster Assistant	**Blaster**	**Blasting & Painting Inspector**	**Blasting & Painting Supervisor**	**Blasting & Painting Superintendent**

KNOWLEDGE REQUIREMENT		• Blasting specifications in oil & gas industry.
		• Blasting application technique: its advantages and limitations.
		• Safe work practices which include:
		  • Working at Height
		  • Working in Confined Space
		  • Housekeeping at Workplace
			• Basic blasting & painting controlled parameters which include:
			  • temperature/humidity/ wind
			• Technical writing skill.
			• People managementManagement skill.
			• Interpersonal skill.
			• Communications skill.
			• 3R concept; Reduce, Reuse, Recycle.		

ABILITIES REQUIREMENT		• Interpret blasting requirements.
		• Carry out preparation which includes:
		  • surface preparation
		  • protection works such as masking/ patching
		• Maintain blasting tools.
		• Perform blasting work which includes:
		  • St. 2/ St. 3
		  • Sa 3/ Sa 2/ Sa 1/ Sa 2.5
		• Adhere to safety procedures.
		• Respond to unsafe conditions at work place.
			• Interpret Client requirements.
			• Inspect blasting works which include:
			  • type of blasting materials
			  • surface finish
			• Inspect painting preparation which includes:
			  • work piece surface temperature
			  • environment humidity
			• Inspect painting works which include:
			  • paint specification
			  • painting application
			  • painting thickness
			• Monitor adherence to safety procedures.
			• Conscious of unsafe conditions surrounding the work place.
			• Concern about sustainability and wastage.		

SKILL AREA	Onshore Facilities & Downstream Plants Skillsets in Project Activities				
SKILLSET	BLASTING & PAINTING				
SKILL DESCRIPTION	Blasting & painting works describe the activities of surfaces preparation and coating application of structures or piping or equipment to a defined standard for protection of the surface from rust or corrosion damage due to exposure to the environment. *[NOTE: Highlighted columns are for job in-demand. Personnel career development will start from the lowest level, moving upwards]*				
COMPETENCY DESCRIPTION	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
	Painting Assistant	Painter	Blasting & Painting Inspector	Blasting & Painting Supervisor	Blasting & Painting Superintendent

KNOWLEDGE REQUIREMENT		• Coating application specifications in oil & gas industry.
		• Painting application technique: its advantages and limitations.
		• Safe work practices which include:
		  • Working at Height
		  • Working in Confined Space
		  • Housekeeping at Workplace
			• Basic blasting & painting controlled parameters which include:
			  • temperature/humidity/ wind
			• Technical writing skill.
			• People managementPeople Management skill.
			• Interpersonal skill.
			• Communications skill.
			• 3R concept; Reduce, Reuse, Recycle.		

ABILITIES REQUIREMENT		• Interpret painting requirements.
		• Mix paint additives as per specification.
		• Carry out preparation which includes:
		  • surface preparation
		  • protection works such as masking/ patching
		• Maintain painting tools.
		• Apply painting technique which includes:
		  • brush
		  • roller
		  • airless spray
		• Perform painting work which includes:
		  • base coat
		  • intermediate coat
		  • finishing coat
		• Adhere to safety procedures.
		• Respond to unsafe conditions at work place.
			• Interpret Client requirements.
			• Inspect blasting works which include:
			  • type of blasting materials
			  • surface finish
			• Inspect painting preparation which includes:
			  • work piece surface temperature
			  • environment humidity
			• Inspect painting works which include:
			  • paint specification
			  • painting application
			  • painting thickness
			• Monitor adherence to safety procedures.
			• Conscious ofof unsafe conditions surrounding the work place.
			• Concern about sustainability and wastage.		

SKILL AREA	Onshore Facilities & Downstream Plants Skillsets in Project Activities				
SKILLSET	ROTATING EQUIPMENT				
SKILL DESCRIPTION	Rotating Equipment project works describe the activities of installing, levelling, alignment and piping tie-ins works. The work includes commissioning and performance test run of the rotating equipment. *[NOTE: Highlighted columns are for job in-demand. Personnel career development will start from the lowest level, moving upwards]*				
COMPETENCY DESCRIPTION	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
	Rotating Equipment Assistant	**Rotating Equipment Technician**	**Rotating Equipment Foreman**	**Rotating Equipment Supervisor**	**Rotating Equipment Superintendent**

KNOWLEDGE REQUIREMENT		• Types and application of pumps which includes:
		  • centrifugal (horizontal)
		  • centrifugal (vertical)
		  • plunger
		  • screw
		  • diaphragm
		• Overhaul procedures of single-stage centrifugal pump.
		• Overhaul procedures of positive displacement pump which includes:
		  • plunger
		  • diaphragm
		• Safe work practices which includes:
		  • Working at Height
		  • Working in Confined Space
		  • Housekeeping at Workplace
			• Interpret pump defect notification.
			• Basic troubleshooting of pumps defect which includes:
			  • low/ no flow rate
			  • high/ low/ no pumping pressure
			  • high/ low running temperature
			• Overhaul procedures of multi-stage centrifugal pump.
			• Overhaul procedures of positive displacement pump which includes:
			  • screw
			  • rotary
			• Technical writing skill.
			• People managementPeople Management skill.
			• Interpersonal skill.
			• Communications skill.
			• 3R concept; Reduce, Reuse, Recycle.		

COMPETENCY DESCRIPTION	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
	Rotating Equipment Assistant	Rotating Equipment Technician	Rotating Equipment Foreman	Rotating Equipment Supervisor	Rotating Equipment Superintendent

ABILITIES (CONTINUE)		• Interpret notification of compressor/ pump defect.
		• Carry out preventive maintenance types of compressor which include:
		  • centrifugal
		  • reciprocating
		  • screw
		• Carry out preventive maintenance types of pumps which include:
		  • centrifugal (horizontal)
		  • centrifugal (vertical)
		  • plunger
		  • screw
		  • diaphragm
		• Carry out overhauling of single-stage centrifugal pump.
		• Carry out servicing of positive displacement pumps which include:
		  • plunger
		  • screw
		  • diaphragm
		• Perform pump/ motor alignment.
		• Prepare compressor/ pump overhauling report.
		• Adhere to safety procedures.
		• Respond to unsafe conditions at work place.
			• Interpret scope of rotating equipment defect.
			• Prepare work schedule and manpower assignment.
			• Perform basic troubleshooting of rotating equipment which includes:
			  • compressors
			  • pumps
			  • mixers
			  • blowers
			  • air fin fans
			• Carry out overhauling of air compressor.
			• Carry out overhauling of multi-stage centrifugal pump.
			• Perform pump/ motor or pump/ steam turbine alignment.
			• Prepare rotating equipment overhauling report.
			• Monitor adherence to safety procedures.
			• Conscious ofof unsafe conditions surrounding the work place.
			• Concern about sustainability and wastage.
			• Hazard risk assessment and documentation which include:
			  • Job Safety Analysis (JSA)
			  • Permit to Work (PTW)
			  • Toolbox Briefing
			• Prepare work schedule and manpower assignment.		

SKILL AREA	Onshore Facilities & Downstream Plants Skillsets in Project Activities				
SKILLSET	FLANGE MANAGEMENT				
SKILL DESCRIPTION	Flange management works describe the activities of ensuring mechanical joint integrity of equipment nozzle or piping flanges to prevent joint leakage. The job involves ensuring proper components used and tightening method employed in order to provide joint integrity assurance and leak-free operations. *[NOTE: Highlighted columns are for job in-demand. Personnel career development will start from the lowest level, moving upwards]*				
COMPETENCY DESCRIPTION	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
	Bolting Fitter	**Bolter**	**Bolting Foreman**	**Flange Management Inspector**	**Flange Management Superintendent**

KNOWLEDGE REQUIREMENT	• Types of flanges which include:
	  • flat-face
	  • raised-face
	  • ring-joint face
	  • lap-joint face
	  • male & female face
	  • tongue & groove face
	• Safe work practices which include:
	  • Working at Height
	  • Working in Confined Space
	• Housekeeping at Workplace
		• Basic understanding of isometric drawing which includes:
		  • flange type
		  • gasket specifications
		  • bolts/ nuts specifications
		• Safe work practices which include:
		  • Working at Height
		  • Working in Confined Space
		  • Housekeeping at Workplace
			• Basic understanding of P&ID drawing which includes:
			  • piping class/ specifications
			  • ASME relevant codes and standards
			• Technical writing skill.
			• People managementPeople Management skill.
			• Interpersonal skill.
			• Communications skill.
			• 3R concept; Reduce, Reuse, Recycle.
				• Basic understanding of drawings which include:
				  • P&ID
				  • piping general arrangements
				  • piping isometric
				• Types of piping joint tightness defects.
				• Technical writing skill.
				• People managementPeople Management skill.
				• Interpersonal skill.
				• Communications skill.
				• 3R concept; Reduce, Reuse, Recycle.	

ABILITIES REQUIREMENT	• Interpret scope of work as per job instruction.
	• Check flanges parallelism.
	• Perform pre-tightening check which includes:
	  • flange faces
	  • gasket type
	  • stud-bolts/ nuts specifications
	• Apply Molykote lubricant onto the stud-bolts and nuts.
	• Perform flange joint tightening technique which includes:
	  • manual torque wrench
	  • hydraulic torque wrench
	• Prepare joint tightening checklist.
	• Adhere to safety procedures.
	• Respond to unsafe conditions at work place.
		• Interpret piping isometric drawings.
		• Perform flange joint tightening technique which includes:
		  • manual torque wrench
		  • hydraulic torque wrench
		  • hydraulic bolt tensioning
		• Prepare joint completion certificate.
		• Adhere to safety procedures.
		• Respond to unsafe conditions at work place.
			• Interpret P&ID drawings.
			• Interpret torquing value.
			• Prepare work schedule and manpower assignment.
			• Verify flange joint tightness.
			• Monitor adherence to safety procedures.
			• Conscious ofof unsafe conditions surrounding the work place.
			• Hazard risk assessment and documentation which include:
			  • Job Safety Analysis (JSA)
			  • Permit to Work (PTW)
			  • Toolbox Briefing
			• Prepare work schedule and manpower assignment.
				• Interpret P&ID, piping class and isometric drawings.
				• Inspect flange joint tightness which includes:
				  • flange visual conditions
				  • flange parallelism
				  • flange spacing/ gap
				  • bolts/ nut looseness
				  • uneven stud-bolts length
				  • gasket specifications
				  • tightening method/ specification
				• Monitor adherence to safety procedures.
				• Conscious ofof unsafe conditions surrounding the work place.
				• Concern about sustainability and wastage.	

SKILL AREA	Onshore Facilities & Downstream Plants Skillsets in Project Activities				
SKILLSET	RADIOGRAPHIC TESTING				
SKILL DESCRIPTION	Radiographic testing (RT) works describe the activities of performing non-destructive examination (NDE) technique that involves the use of either gamma-rays or x-rays to view the internal structure of a component. In the oil & gas industry, RT is often used to inspect machinery, such as pressure vessels and piping, to detect for flaws. *[NOTE: Highlighted columns are for job in-demand. Personnel career development will start from the lowest level, moving upwards]*				
COMPETENCY DESCRIPTION	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
	Radiographic Testing Technician Level 1	**Radiographic Testing Technician Level 2**	**Radiographic Testing Supervisor**	**No Level**	**No Level**

KNOWLEDGE REQUIREMENT	• Malaysian regulations on handling and transporting radiographic testing materials.
	• Understanding of drawings which include:
	  • Plot Plan
	  • General Arrangement
	  • Isometric drawing
	• Safe exposure limits as radiographic testing operator which includes:
	  • personal exposure monitoring badge
	  • safe exposure distance and duration
	• Radiographic testing operating practices which include:
	  • strength of source
	  • thickness of material versus exposure time
	• Codes and standards for welding flaws and defects which include:
	  • porosity
	  • slag intrusion
	  • undercut
	  • insufficient penetration
	• Safe work practices which include:
	  • Working at Height
	  • Working in Confined Space
	  • Housekeeping at Workplace
		• Malaysian regulations on handling and transporting radiographic testing materials.
		• Setting up requirements for radiographic developing room.
		• Storage requirements of radiographic source.
		• Understanding limitations of radiographic testing method.
		• Prepare work schedule and manpower assignment.
		• Perform basic troubleshooting of radiographic testing equipment.
		• Technical writing skill.
		• People managementPeople Management skill.
		• Interpersonal skill.
		• Communications skill.
		• Safe work practices which include:
		  • Working at Height
		  • Working in Confined Space
		  • Housekeeping at Workplace			

COMPETENCY DESCRIPTION	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5

ABILITIES (CONTINUE)	**Radiographic Testing Technician Level 1**
	• Interpret radiography testing scope of work.
	• Perform x-ray/ gamma ray radiography testing equipment periodic check.
	• Carry out x-ray/ gamma ray radiographic testing equipment inventory control.
	• Transport and store x-ray/ gamma ray radiographic testing equipment as per regulatory requirements.
	• Setup x-ray/ gamma ray radiographic testing which includes:
	  • locate test area
	  • condone hazardous boundary
	  • identify equipment location
	• Conduct x-ray/ gamma ray radiography shoot of test piece which includes:
	  • tag joint for identification
	  • place radiography film
	  • place radiography source
	  • shoot based on source exposure time
	• Perform radiography film processing which includes:
	  • setup dark room
	  • automatic/ manual film processing
	• Interpret radiographic test result as per codes and standards.
	• Prepare radiographic test report.
	• Adhere to safety procedures.
	• Respond to unsafe conditions at work place.
		Radiographic Testing Technician Level 2
		• Interpret radiography testing scope of work against applicable Radiographic Testing Procedure.
		• Validate x-ray/ gamma ray radiography testing equipment periodic check.
		• Coordinate x-ray/ gamma ray radiographic testing equipment inventory replenishment.
		• Coordinate storage of x-ray/ gamma ray radiographic testing equipment with Client as per regulatory requirements.
		• Select and define the limitations and advantages of radiographic test method.
		• Provide x-ray/ gamma ray radiographic testing guidance.
		• Conduct x-ray/ gamma ray radiography shoot on test piece which includes:
		  • tag joint for identification
		  • place radiography film
		  • place radiography source
		  • shoot based on source exposure time
		• Verify interpretation of radiographic test result as per codes and standards.
		  • re-shoot, if necessary
		  • accept/ reject interpretation
		• Validate radiographic test report.
		• Present radiographic test result to Client.
		• Monitor adherence to safety procedures.
		• Conscious ofof unsafe conditions surrounding the work place.
		• Concern about sustainability and wastage.
			Radiographic Testing Supervisor	**No Level**	**No Level**

SKILL AREA	Onshore Facilities & Downstream Plants Skillsets in Project Activities				
SKILLSET	ULTRASONIC TESTING				
SKILL DESCRIPTION	Ultrasonic testing (UT) works describe the activities of performing non-destructive examination (NDE) technique based on propagation of ultrasonic waves in the object or material tested. In the oil & gas industry, UT is often used to detect internal flaws or to perform thickness measurement, often to monitor pipework corrosion. *[NOTE: Highlighted columns are for job in-demand. Personnel career development will start from the lowest level, moving upwards]*				
COMPETENCY DESCRIPTION	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
	Ultrasonic Testing Technician Level-1	**Ultrasonic Testing Technician Level-2**	**Ultrasonic Testing Supervisor**	**No Level**	**No Level**

KNOWLEDGE REQUIREMENT	• Understanding of drawings which include:
	  • Plot Plan
	  • General Arrangement
	  • Isometric drawing
	• Ultrasonic testing operating practices which include:
	  • UT applications
	  • UT limitations
	• Codes and standards for welding flaws and defects which include:
	  • welding defects
	  • thickness measurement
	• Safe work practices which include:
	  • Working at Height
	  • Working in Confined Space
	  • Housekeeping at Workplace
		• Understanding limitations of ultrasonic testing method.
		• Prepare work schedule and manpower assignment.
		• Perform basic troubleshooting of ultrasonic testing equipment.
		• Technical writing skill.
		• People managementPeople Management skill.
		• Interpersonal skill.
		• Communications skill.
		• Safe work practices which include:
		  • Working at Height
		  • Working in Confined Space
		  • Housekeeping at Workplace			

ABILITIES REQUIREMENT	• Interpret ultrasonic testing scope of work.
	• Perform ultrasonic testing equipment periodic check and calibration.
	• Carry out ultrasonic testing equipment inventory control.
	• Conduct ultrasonic testing on test piece which includes:
	  • prepare joint surface area
	  • apply gel on test piece
	  • perform thickness measurement ultrasonic testing
		• Select and define limitations and advantages of ultrasonic testing technique.
		• Validate ultrasonic testing equipment periodic check and calibration.
		• Coordinate ultrasonic testing equipment inventory replenishment.
		• Provide ultrasonic testing guidance.			

COMPETENCY DESCRIPTION	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
ABILITIES (CONTINUE)	**Ultrasonic Testing Technician Level-1** • perform lamination ultrasonic testing • observe readings • Interpret ultrasonic test result as per codes and standards. • Prepare ultrasonic test report. • Adhere to safety procedures. • Respond to unsafe conditions at work place.	**Ultrasonic Testing Technician Level-2** • Conduct ultrasonic testing on test piece which includes: • groove plates • pipe and nozzle • T-K-Y weld joints • Perform ultrasonic testing interpretation and evaluation according to codes, standards, specifications and procedures. • Supervise ultrasonic testing of Technician Level-1. • Report the results of ultrasonic testing on welded construction. • Validate ultrasonic test report by Technician Level-1. • Present ultrasonic test result to Client. • Monitor adherence to safety procedures. • Conscious ofof unsafe conditions surrounding the work place. • Concern about sustainability and wastage.	**Ultrasonic Testing Supervisor**	**No Level**	**No Level**

SKILL AREA	Onshore Facilities & Downstream Plants Skillsets in Project Activities				
SKILLSET	EDDY CURRENT TESTING				
SKILL DESCRIPTION	Eddy-current testing (ECT) works describe the activities of performing non-destructive examination (NDE) technique for conductive materials. In the oil & gas industry, ECT is often used to detect pitting, cracking and corrosion of tubes of coolers or exchangers. It can also be used to detect metal hardness and the thickness of non-conductive coating or metal parts such as paint. *[NOTE: Highlighted columns are for job in-demand. Personnel career development will start from the lowest level, moving upwards]*				
COMPETENCY DESCRIPTION	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
	Eddy Current Testing Technician Level-1	**Eddy Current Testing Technician Level-2**	**Eddy Current Testing Supervisor**	**No Level**	**No Level**

KNOWLEDGE REQUIREMENT	• Understanding of drawings which include:
	  • Plot Plan
	  • General Arrangement
	  • Isometric drawing
	• Eddy current testing operating practices which include:
	  • ECT applications
	  • ECT limitations
	• Codes and standards for welding flaws and defects which include:
	  • welding defects
	  • HEX tubes defects
	• Safe work practices which include:
	  • Working at Height
	  • Working in Confined Space
	  • Housekeeping at Workplace
		• Understanding limitations of eddy current testing method.
		• Prepare work schedule and manpower assignment.
		• Perform basic troubleshooting of eddy current testing equipment.
		• Technical writing skill.
		• People managementPeople Management skill.
		• Interpersonal skill.
		• Communications skill.
		• Safe work practices which include:
		  • Working at Height
		  • Working in Confined Space
		  • Housekeeping at Workplace			

ABILITIES REQUIREMENT	• Interpret eddy current testing scope of work.
	• Perform eddy current testing equipment periodic check.
	• Carry out eddy current testing equipment inventory control.
	• Conduct eddy current on test piece which includes:
	  • prepare joint surface area
	  • conductivity inspection
	  • surface inspection
	  • thin material thickness measurement
		• Select and define limitations and advantages of eddy current testing technique.
		• Validate eddy current testing equipment periodic check and calibration.
		• Coordinate eddy current testing equipment inventory replenishment.
		• Provide eddy current testing guidance.
		• Conduct eddy current testing on test piece which includes:
		• tubing inspection			

COMPETENCY DESCRIPTION	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
ABILITIES (CONTINUE)	**Eddy Current Testing Technician Level-1** • bolt hole inspection • observe readings • Interpret eddy current result as per codes and standards. • Prepare eddy current test report. • Adhere to safety procedures. • Respond to unsafe conditions at work place.	**Eddy Current Testing Technician Level-2** • Perform eddy current testing interpretation and evaluation according to codes, standards, specifications and procedures. • Supervise eddy current testing of Technician Level-1. • Validate eddy current test report by Technician Level-1. • Present eddy current test result to Client. • Monitor adherence to safety procedures. • Conscious ofof unsafe conditions surrounding the work place. • Concern about sustainability and wastage.	**Eddy Current Testing Supervisor**	**No Level**	**No Level**

SKILL AREA	Onshore Facilities & Downstream Plants Skillsets in Project Activities				
SKILLSET	DYE PENETRANT TESTING				
SKILL DESCRIPTION	Dye penetrant testing (DPT) works describe the activities of performing non-destructive examination (NDE) technique widely used to detect surface breaking flaws such as cracks, porosity, laps, seams and other surface discontinuities. *[NOTE: Highlighted columns are for job in-demand. Personnel career development will start from the lowest level, moving upwards]*				
COMPETENCY DESCRIPTION	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
	Dye Penetrant Testing Technician Level-1	**Dye Penetrant Testing Technician Level-2**	**Dye Penetrant Testing Supervisor**	**No Level**	**No Level**

KNOWLEDGE REQUIREMENT	• Test piece preparation requirements which includes:
	  • surface condition
	  • surface temperature
	• Understanding of drawings which includes:
	  • Plot Plan
	  • General Arrangement
	  • Isometric drawing
	• Codes and standards for welding flaws and defects.
		• Understanding limitations of dye penetrant testing method.
		• Prepare work schedule and manpower assignment.
		• Codes and standards for welding flaws and defects.
		• Technical writing skill.
		• People managementPeople Management skill.
		• Interpersonal skill.
		• Communications skill.			

ABILITIES REQUIREMENT	• Interpret dye penetrant testing scope of work.
	• Carry out dye penetrant testing equipment inventory control.
	• Conduct dye penetrant testing on test piece which includes:
	  • prepare joint surface area
	  • fluorescent and visible penetrant testing
	  • wet/ dry penetrant testing
	  • observe readings
	• Interpret dye penetrant test result as per codes and standards.
	• Prepare dye penetrant test report.
	• Adhere to safety procedures.
	• Respond to unsafe conditions at work place.
		• Select and define limitations and advantages of dye penetrant testing technique.
		• Coordinate dye penetrant testing inventory replenishment.
		• Provide dye penetrant testing guidance.
		• Perform dye penetrant testing interpretation and evaluation according to codes, standards, specifications and procedures.
		• Supervise dye penetrant testing of Technician Level-1.
		• Validate dye penetrant test report by Technician Level-1.
		• Present dye penetrant test result to Client.
		• Monitor adherence to safety procedures.
		• Conscious ofof unsafe conditions surrounding the work place.
		• Concern about sustainability and wastage.			

SKILL AREA	Onshore Facilities & Downstream Plants Skillsets in Project Activities				
SKILLSET	MAGNETIC PARTICLE TESTING				
SKILL DESCRIPTION	Magnetic particle testing (MPT) works describe the activities of performing non-destructive examination (NDE) technique used to detect surface and slightly subsurface flaws in ferromagnetic materials such as iron, nickel, cobalt and some alloys. In the oil & gas industry, MPT is often used to detect surface breaking such as cracking, pores, cold laps, lack of sidewall fusion in welds. *[NOTE: Highlighted columns are for job in-demand. Personnel career development will start from the lowest level, moving upwards]*				
COMPETENCY DESCRIPTION	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
	Magnetic Particle Testing Technician Level-1	**Magnetic Particle Testing Technician Level-2**	**Magnetic Particle Testing Supervisor**	**No Level**	**No Level**

KNOWLEDGE REQUIREMENT	• Understanding of drawings which include:
	  • Plot Plan
	  • General Arrangement
	  • Isometric drawing
	• Magnetic particle testing operating practices which include:
	  • MPT applications
	  • MPT limitations
	• Codes and standards for welding flaws and defects which include:
	  • welding defects
	• Safe work practices which include:
	  • Working at Height
	  • Working in Confined Space
	  • Housekeeping at Workplace
		• Understanding limitations of eddy current testing method.
		• Prepare work schedule and manpower assignment.
		• Perform basic troubleshooting of eddy current testing equipment.
		• Technical writing skill.
		• People managementPeople Management skill.
		• Interpersonal skill.
		• Communications skill.
		• Safe work practices which include:
		  • Working at Height
		  • Working in Confined Space
		  • Housekeeping at Workplace			

ABILITIES REQUIREMENT	• Interpret magnetic particle testing scope of work.
	• Perform magnetic particle testing equipment periodic check.
	• Carry out magnetic particle testing equipment inventory control.
	• Conduct magnetic particle on test piece which includes:
	  • prepare joint surface area
	  • fluorescent and visible testing
	  • wet/ dry magnetic particle testing
	  • observe readings
	• Interpret magnetic particle result as per codes and standards.
		• Select and define limitations and advantages of magnetic particle testing technique.
		• Validate magnetic particle testing equipment periodic check and calibration.
		• Coordinate magnetic particle testing equipment inventory replenishment.
		• Provide magnetic particle testing guidance.
		• Perform magnetic particle testing interpretation and evaluation according to codes, standards, specifications and procedures.			

COMPETENCY DESCRIPTION	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
ABILITIES (CONTINUE)	**Magnetic Particle Testing Technician Level-1** • Prepare magnetic particle test report. • Adhere to safety procedures. • Respond to unsafe conditions at work place.	**Magnetic Particle Testing Technician Level-2** • Supervise magnetic particle testing of Technician Level-1. • Present magnetic particle test result to Client. • Monitor adherence to safety procedures. • Conscious ofof unsafe conditions surrounding the work place. • Concern about sustainability and wastage.	**Magnetic Particle Testing Supervisor**	**No Level**	**No Level**

SKILL AREA	Onshore Facilities & Downstream Plants Skillsets in Project Activities				
SKILLSET	ELECTRICAL				
SKILL DESCRIPTION	Electrical project works describe the activities of installation, testing and commissioning of electrical equipment or components, electrical system as well as laying and termination of electrical cabling works. In the oil & gas industry, Ex rated equipment and components are used based on the hazardous area classification requirements. *[NOTE: Highlighted columns are for job in-demand. Personnel career development will start from the lowest level, moving upwards]*				
COMPETENCY DESCRIPTION	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
	No Level	Wireman	Electrical IEC Ex Technician	Electrical IEC Ex Inspector	Electrical IEC Ex Superintendent

KNOWLEDGE REQUIREMENT		• Understand single-line diagram.
		• Safe work practices which include:
		  • Working at Height
		  • Working in Confined Space
		  • Housekeeping at Workplace
			• Electricity fundamentals and physics.
			• Process, electrical equipment and electrical drawings.
			• Knowledge of hazardous area classification and explosion-proof requirements.
			• IEC Ex classification on electrical equipment and components.
			• Lock-Out, Tag-Out (LOTO) rules and procedures.
			• Hazards, electrical risk and safety at work.
			• Protections layers concept.
			• Technical writing skill.
			• People managementPeople Management skill.
			• Interpersonal skill.
			• Communications skill.
			• 3R concept; Reduce, Reuse, Recycle.
				• Electricity fundamentals and physics.
				• Process, electrical equipment and electrical drawings.
				• Knowledge of hazardous area classification and explosion-proof requirements.
				• IEC Ex classification on electrical equipment and components.
				• Lock-Out, Tag-Out (LOTO) rules and procedures.
				• Hazards, electrical risk and safety at work.
				• Protections layers concept.
				• Technical writing skill.
				• People managementPeople Management skill.
				• Interpersonal skill.
				• Communications skill.
				• 3R concept; Reduce, Reuse, Recycle.	

ABILITIES REQUIREMENT		• Interpret wiring diagram and electrical circuit. • Carry out electrical cable laying works. • Perform electrical wiring continuity check. • Adhere to safety procedures. • Respond to unsafe conditions at work place.	• Interpret scope of electrical equipment construction works. • Carry out electrical cable termination works. • Perform installation of electrical cable glands; Ex-certified. • Perform electrical equipment installation works. • Prepare electrical equipment installation report. • Monitor adherence to safety procedures. • Conscious ofof unsafe conditions surrounding the work place. • Concern about sustainability and wastage.	• Interpret scope of electrical equipment construction works. • Perform inspection of electrical cable termination works. • Certify installation of electrical cable glands. • Certify electrical equipment installation works. • Prepare electrical equipment installation certification report. • Monitor adherence to safety procedures. • Conscious ofof unsafe conditions surrounding the work place. • Concern about sustainability and wastage.	

SKILL AREA	Onshore Facilities & Downstream Plants Skillsets in Project Activities				
SKILLSET	FIELD INSTRUMENTATION				
SKILL DESCRIPTION	*Field instrumentation project works describe the activities of activities of installation, testing and commissioning of process control instrumentations such as levels, flow, pressure, temperature, pH and humidity. In the oil & gas industry, Ex rated equipment and components are used based on the hazardous area classification requirements.* *[NOTE: Highlighted columns are for job in-demand. Personnel career development will start from the lowest level, moving upwards]*				
COMPETENCY DESCRIPTION	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
	No Level	**Field Instrument Fitter**	**Field Instrument Technician**	**Field Instrument Inspector**	**Field Instrument Superintendent**

KNOWLEDGE REQUIREMENT		• Knowledge in instrumentation and control.
		• Basic knowledge of hazardous area classification and explosion- proof requirements.
		• Safe work practices which includes:
		  • Working at Height
		  • Working in Confined Space
		  • Housekeeping at Workplace
			• Knowledge in instrumentation, process control and safeguarding.
			• Basic troubleshooting of instrument problems.
			• Technical writing skill.
			• People managementPeople Management skill.
			• Interpersonal skill.
			• Communications skill.
			• 3R concept; Reduce, Reuse, Recycle.		

ABILITIES REQUIREMENT		• Interpret scope of work.
		• Install field transmitter, including instrument tubing.
		• Install control valve, including actuator and instrument air tubing.
		• Lay and terminate instrument cable which includes:
		  • in tray
		  • in trench
		• Install small-bore process piping/ instrument tubing.
		• Record installation, calibration and testing work in check sheet.
		• Install and inspect instrument junction box.
		• Adhere to safety procedures.
		• Respond to unsafe conditions at work place.
			• Conduct inspection of instrument assembly and tubing connections for mechanical joint integrity.
			• Verify laying of instrument cable.
			• Verify calibration and testing of instrument fixtures which include:
			  • control valves
			  • transmitters
			• Inspect instrument junction box.
			• Monitor adherence to safety procedures.
			• Conscious ofof unsafe conditions surrounding the work place.
			• Concern about sustainability and wastage.		

SKILL AREA	Onshore Facilities & Downstream Plants Skillsets in Project Activities				
SKILLSET	QUALITY MEASURING INSTRUMENTS (QMI)				
SKILL DESCRIPTION	Quality measuring instruments (QMI) project works describe the activities of installation, testing and commissioning of QMI equipment such as flow meters for process or custody measurements of process flows. In the oil & gas industry, Ex rated equipment and components are used based on the hazardous area classification requirements. *[NOTE: Highlighted columns are for job in-demand. Personnel career development will start from the lowest level, moving upwards]*				
COMPETENCY DESCRIPTION	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5
	No Level	QMI Fitter	QMI Technician	QMI Supervisor	QMI Superintendent

KNOWLEDGE REQUIREMENT		• Knowledge in quality measuring instrument.
		• Basic knowledge of hazardous area classification and explosion- proof requirements.
		• Safe work practices which include:
		  • Working at Height
		  • Working in Confined Space
		  • Housekeeping at Workplace
			• Principal knowledge in QMI which includes:
			  • analysers
			  • monitors
			  • chromatographs
			• Basic troubleshooting of QMI problems.
			• Understand regulatory requirements on custody transfer meters.
			• Technical writing skill.
			• People managementPeople Management skill.
			• Interpersonal skill.
			• Communications skill.
			• 3R concept; Reduce, Reuse, Recycle.		

ABILITIES REQUIREMENT		• Interpret scope of work. • Install QMI components. • Carry out testing of QMI components. • Prepare documents, manuals, procedures, drawings for QMI systems. • Adhere to safety procedures. • Respond to unsafe conditions at work place.	• Verify installation of QMI components. • Perform testing/ commissioning of QMI equipment. • Coordinate calibration of custody transfer meters to regulatory requirements. • Monitor adherence to safety procedures. • Conscious ofof unsafe conditions surrounding the work place. • Concern about sustainability and wastage.		

Certifications & Training Needs

NO	COMPETENCIES PROFILE	TECHNICAL-SKILLS	SOFT-SKILLS	CERTIFICATION PROGRAMME

1	**L2: STRUCTURAL WELDER**
	
	Relevant Activities:
	Maintenance
	Turnaround
	Project Works
		• Manual welding technique.
		• Semi-automatic welding technique.
		• Types of joints and welding technique which includes:
		  • butt joint
		  • corner joint
		  • lap joint
		  • tee joint
		  • edge joint
		• Hazards in welding.
			N/A	**Mandatory HSE Certification**
				• CIDB Construction Personnel AND
				• NIOSH Oil & Gas Safety Passport.
				
				Competency Certification
				• CIDB SKK for Welder (various grades) OR
				• JPK SKM L2 Welding.

2	**L3: STRUCTURAL WELDING FOREMAN**
	
	Relevant Activities:
	Maintenance
	Turnaround
	Project Works
		• Manual welding technique.
		• Semi-automatic welding technique.
		• Drawings and symbols which include:
		  • Shop drawings
		  • Welding symbols
		• Type of welding defects and repair procedures.
		• Basic understanding of welding procedures which include:
		  • Welding Procedure Specification (WPS)
		  • Welder Qualification Test (WQT)
		• Hazard risk assessment which includes:
		  • Job Method Statement (JMS)
		  • Job Safety Analysis (JSA)
		  • Permit to Work (PTW)
		  • Toolbox Briefing
		• Work Planning and Scheduling which include:
		  • materials and consumables planning
		  • tools and equipment optimisation
		  • manpower assignment
			• Supervisory Skills.
			• Communication Skills.
			• 3R concept; Reduce, Reuse, Recycle.
				Mandatory HSE Certification
				• CIDB Construction Personnel AND
				• NIOSH Oil & Gas Safety Passport.
				
				Competency Certification
				• CIDB SKK for Welder Foremen (various grades) OR
				• JPK SKM L3 Welding.

3	**L2: PIPING WELDER**
	
	Relevant Activities:
	Maintenance
	Turnaround
	Project Works
		• Manual welding technique.
		• Semi-automatic welding technique.
		• Types of joints and welding technique which includes:
		  • butt joint
		  • corner joint
		  • lap joint
		  • tee joint
		  • edge joint
		• Hazards in welding.
			N/A	**Mandatory HSE Certification**
				• CIDB Construction Personnel AND
				• NIOSH Oil & Gas Safety Passport.
				
				Competency Certification
				• CIDB SKK for Welder (various grades) OR
				• JPK SKM L2 Welding.

NO	COMPETENCIES PROFILE	TECHNICAL-SKILLS	SOFT-SKILLS	CERTIFICATION PROGRAMME

4	**L3: PIPING WELDING FOREMAN**
	
	Relevant Activities:
	Maintenance
	Turnaround
	Project Works
		• Manual welding technique.
		• Semi-automatic welding technique.
		• Type of welding defects and repair procedures.
		• Basic understanding of welding procedures which includes:
		  • Welding Procedure Specification (WPS)
		  • Welder Qualification Test (WQT)
		• Hazard risk assessment which includes:
		  • Job Method Statement (JMS)
		  • Job Safety Analysis (JSA)
		  • Permit to Work (PTW)
		  • Toolbox Briefing
		• Work Planning and Scheduling which includes:
		  • materials and consumables planning
		  • tools and equipment optimisation
		  • manpower assignment
			• Supervisory Skills.
			• Communication Skills.
			• 3R concept; Reduce, Reuse, Recycle.
				Mandatory HSE Certification
				• CIDB Construction Personnel AND
				• NIOSH Oil & Gas Safety Passport.
				
				Competency Certification
				• CIDB SKK for Welder Foremen (various grades) OR
				• JPK SKM L3 Welding.

5	**L2: PIPE FITTER**
	
	Relevant Activities:
	Maintenance
	Turnaround
	Project Works
		• Construction drawings which include:
		  • Piping General Arrangement (GA)
		  • Piping plan and elevation
		  • Isometric
		• Understanding Piping & Instrumentation Diagram (P&ID).
		• Types of cutting tools and technique which include:
		  • oxy-acetylene cutting
		  • plasma cutting
		  • abrasive cutting
		  • rotary pipe cutter
		• Types of edge preparations technique which include:
		  • single-V
		  • double-V
			• Housekeeping at Work-place; practice of 3R concept.	**Mandatory HSE Certification**
				• CIDB Construction Personnel AND
				• NIOSH Oil & Gas Safety Passport AND
				• NIOSH Working at Height, if required AND
				• DOSH Authorised Entrant & Standby Person (AESP), if required.
				
				Competency Certification
				• JPK SKM L2 Pipe Fitting Operation OR
				• CIDB SKK for Fitter**
				
				** proposed for CIDB to develop O&G national level Sijil Kecekapan Kemahiran (SKK) programme.

6	**L3: PIPE FITTING FOREMAN**
	
	Relevant Activities:
	Maintenance
	Turnaround
	Project Works
		• Construction drawings which include:
		  • Piping General Arrangement (GA)
		  • Piping plan and elevation
		  • Isometric
		• Drawings and symbols which include:
		  • Shop drawings
		  • Welding symbols
		• Type of welding defects and repair procedures.
		• Basic understanding of welding procedures which include:
		  • Welding Procedure Specification (WPS)
		  • Welder Qualification Test (WQT)
			• Supervisory Skills.
			• Communication Skills.
			• 3R concept; Reduce, Reuse, Recycle.
				Mandatory HSE Certification
				• CIDB Construction Personnel AND
				• NIOSH Oil & Gas Safety Passport AND
				• NIOSH Working at Height, if required AND
				• DOSH Authorised Entrant & Standby Person (AESP), if required.
				
				Competency Certification
				• JPK SKM L3 Pipe Fitting Operation OR
				• CIDB SKK for Fitting Foreman**
				** proposed for CIDB to develop O&G national level Sijil Kecekapan Kemahiran (SKK) programme.

NO	COMPETENCIES PROFILE	TECHNICAL-SKILLS	SOFT-SKILLS	CERTIFICATION PROGRAMME

		• Hazard risk assessment which includes:
		  • Job Method Statement (JMS)
		  • Job Safety Analysis (JSA)
		  • Permit to Work (PTW)
		  • Toolbox Briefing
		• Work Planning and Scheduling which includes:
		  • materials and consumables planning
		  • tools and equipment optimisation
		  • manpower assignment		

7	**L2: RIGGER**
	
	Relevant Activities:
	Maintenance
	Turnaround
	Project Works
		• Hoisting and rigging hazards.
		• Basic hoisting and rigging operations and procedures.
		• Hand signals for overhead crane or mobile crane.
		• Types, application and limitations of hoisting devices which include:
		  • electric-powered hoist
		  • air-powered hoist
		  • hand chain operated
		• Maintenance and testing of rigging and slinging equipment which include:
		  • sling -cable, chain, rope or webbing
		  • rigging -shackle, eye-bolt, pulley or turnbuckles
			• N/A	**Mandatory HSE Certification**
				• CIDB Construction Personnel AND
				• NIOSH Oil & Gas Safety Passport.
				
				Competency Certification
				• CIDB SKK for Rigger**
				
				** proposed for CIDB to develop O&G national level Sijil Kecekapan Kemahiran (SKK) programme.

8	**L3: RIGGING FOREMAN**
	
	Relevant Activities:
	Maintenance
	Turnaround
	Project Works
		• Basic understanding of rigging and slinging procedures which include:
		  • lifting tools applications and limitations
		  • lifting tools and equipment preparations
		• Hazard risk assessment which includes:
		  • Job Method Statement (JMS)
		  • Job Safety Analysis (JSA)
		  • Permit to Work (PTW)
		  • Toolbox Briefing
		• Work Planning and Scheduling which includes:
		  • materials and consumables planning
		  • tools and equipment optimisation
		  • manpower assignment
			• Supervisory Skills.
			• Communication Skills.
			• 3R concept; Reduce, Reuse, Recycle
				Mandatory HSE Certification
				• CIDB Construction Personnel AND
				• NIOSH Oil & Gas Safety Passport.
				
				Competency Certification
				• CIDB SKK for Rigging Foreman**
				
				** proposed for CIDB to develop O&G national level Sijil Kecekapan Kemahiran (SKK) programme.

NO	COMPETENCIES PROFILE	TECHNICAL-SKILLS	SOFT-SKILLS	CERTIFICATION PROGRAMME

9	**L4: RIGGING SUPERVISOR**
	
	Relevant Activities:
	Maintenance
	Turnaround
	Project Works
		• Lifting Plan Operation at Workplace which includes:
		  • sling selection -cable, chain, rope or webbing
		  • rigging selection -shackle, eye-bolt, pulley or turnbuckles
		  • type of lifting -routine or non-routine
		  • type of load -weight, CG
		• Inspection of slings for safe lifting.
		• Hazard risk assessment which includes:
		  • Job Method Statement (JMS)
		  • Job Safety Analysis (JSA)
		  • Permit to Work (PTW)
		  • Toolbox Briefing
		• Work Planning and Scheduling which includes:
		  • materials and consumables planning
		  • tools and equipment optimisation
		  • manpower assignment
			• Supervisory Skills.
			• Communication Skills.
			• Technical Writing Skills.
			• 3R concept; Reduce, Reuse, Recycle
				Mandatory HSE Certification
				• CIDB Construction Personnel AND
				• NIOSH Oil & Gas Safety Passport.
				
				Competency Certification
				• CIDB SKK for Rigging Supervisor**
				
				** proposed for CIDB to develop O&G national level Sijil Kecekapan Kemahiran (SKK) programme.

10	**L3: CRANE OPERATOR**
	
	Relevant Activities:
	Maintenance
	Turnaround
	Project Works
		• Understanding mobile crane Load Chart which includes:
		  • boom length versus lifting capacity
		  • with/ without outrigger fully extended
		• Mobile crane safe work practices which include:
		  • soft-ground
		  • underground cables or piping
		  • swing activities over human or equipment
		• Knowledge on estimation of load weight and centre of gravity (CG).
		• Mobile crane care and maintenance.
			• N/A	**Mandatory HSE Certification**
				• CIDB Construction Personnel AND
				• NIOSH Oil & Gas Safety Passport.
				
				Competency Certification
				• DOSH Competent Crane Operator.

11	**L2: HYDRO-JETTING OPERATOR**
	
	Relevant Activities:
	Turnaround
		• Hydro-jetting hazards.
		• Basic hydro-jetting operations and procedures which include:
		  • manual operation
		  • semi-automatic operation
		  • fully automatic operation
		• Maintenance and testing of hydro-jetting equipment which includes:
		  • tubes and pipes cleaning nozzles
		  • high-pressure rigid and flexible lances
		  • foot-operated and pressure regulating valves
		  • pressure gauge and safety valve
			• N/A	**Mandatory HSE Certification**
				• CIDB Construction Personnel AND
				• NIOSH Oil & Gas Safety Passport.
				
				Competency Certification
				• CIDB SKK for Hydro-jetting Operator**
				
				** proposed for CIDB to develop O&G national level Sijil Kecekapan Kemahiran (SKK) programme.

NO	COMPETENCIES PROFILE	TECHNICAL-SKILLS	SOFT-SKILLS	CERTIFICATION PROGRAMME

12	**L2: HYDRO-JETTING FOREMAN**
	
	Relevant Activities:
	Turnaround
		• Basic understanding of hydro-jetting equipment and procedures which include:
		  • hydro-jetting pressure system
		  • electric control panel or pneumatic system
		• Understanding of Scheduled Waste and disposal requirements.
		  • Hazard risk assessment which includes:
		  • Job Method Statement (JMS)
		  • Job Safety Analysis (JSA)
		  • Permit to Work (PTW)
		  • Toolbox Briefing
		• Work Planning and Scheduling which include:
		  • materials and consumables planning
		  • tools and equipment optimisation
		  • manpower assignment
			• Supervisory Skills.
			• Communication Skills.
			• 3R concept; Reduce, Reuse, Recycle.
				Mandatory HSE Certification
				• CIDB Construction Personnel AND
				• NIOSH Oil & Gas Safety Passport.
				
				Competency Certification
				• CIDB SKK for Hydro-jetting Foreman**
				
				** proposed for CIDB to develop O&G national level Sijil Kecekapan Kemahiran (SKK) programme.

13	**L1: LEVEL-1 SCAFFOLDER** Relevant Activities: Maintenance Turnaround Project Works	• Basic Scaffolding Course.	• N/A	**Mandatory HSE Certification** • CIDB Construction Personnel AND • NIOSH Oil & Gas Safety Passport AND • NIOSH Working at Height AND • DOSH Authorised Entrant & Standby Person (AESP), if required. **Competency Certification** • DOSH Competent Scaffolder -Basic AND • CIDB SKK -Registered Scaffolder Erector L1.
14	**L2: LEVEL-2 SCAFFOLDER** Relevant Activities: Maintenance Turnaround Project Works	• Intermediate Scaffolding Course.	• N/A	**Mandatory HSE Certification** • CIDB Construction Personnel AND • NIOSH Oil & Gas Safety Passport AND • NIOSH Working at Height AND • DOSH Authorised Entrant & Standby Person (AESP), if required. **Competency Certification** • DOSH Competent Scaffolder -Intermediate AND • CIDB SKK -Registered Scaffolder Erector L2.

NO	COMPETENCIES PROFILE	TECHNICAL-SKILLS	SOFT-SKILLS	CERTIFICATION PROGRAMME

15	**L3: SCAFFOLDING SUPERVISOR**
	
	Relevant Activities:
	Maintenance
	Turnaround
	Project Works
		• Intermediate Scaffolding Course.
		• Advance Scaffolding Course.
		• Hazard risk assessment which includes:
		  • Job Method Statement (JMS)
		  • Job Safety Analysis (JSA)
		  • Permit to Work (PTW)
		  • Toolbox Briefing
		• Work Planning and Scheduling which include:
		  • materials and consumables planning
		  • tools and equipment optimisation
		  • manpower assignment
			• Supervisory Skills.
			• Communication Skills.
			• Technical Writing Skills.
			• 3R concept; Reduce, Reuse, Recycle.
				Mandatory HSE Certification
				• CIDB Construction Personnel AND
				• NIOSH Oil & Gas Safety Passport AND
				• NIOSH Working at Height AND
				• DOSH Authorised Entrant & Standby Person (AESP), if required.
				
				Competency Certification
				• DOSH Competent Scaffolder -Advance AND
				• CIDB SKK -Registered Scaffolder Supervisor L3.

16	**L3: SCAFFOLDING INSPECTOR** **Relevant Activities:** Maintenance Turnaround Project Works	• Advance Scaffolding Course.	• N/A	**Mandatory HSE Certification** • CIDB Construction Personnel AND • NIOSH Oil & Gas Safety Passport AND • NIOSH Working at Height AND • DOSH Authorised Entrant & Standby Person (AESP), if required. **Competency Certification** • DOSH Competent Scaffolder -Advance AND • CIDB SKK -Registered Scaffolder Supervisor L3.

17	**L2: REFRACTORY APPLICATOR**
	
	Relevant Activities:
	Turnaround
	Project Works
		• Refractory application technique and their limitations which include:
		  • casting
		  • pump casting
		  • gunite
		  • shotcrete
		• Maintenance and testing of refractories application tools and equipment.
			N/A	**Mandatory HSE Certification**
				• CIDB Construction Personnel AND
				• NIOSH Oil & Gas Safety Passport AND
				• DOSH Authorised Entrant & Standby Person (AESP), if required.
				
				Competency Certification
				• CIDB SKK for Refractory Applicator**
				
				** proposed for CIDB to develop O&G national level Sijil Kecekapan Kemahiran (SKK) programme.

NO	COMPETENCIES PROFILE	TECHNICAL-SKILLS	SOFT-SKILLS	CERTIFICATION PROGRAMME

18	**L2: REFRACTORY SUPERVISOR**
	
	Relevant Activities:
	Turnaround
	Project Works
		• Refractory construction drawings which include:
		  • wall tubes
		  • burner throat
		• Types of refractory materials and their applications which include:
		  • fireclay refractory
		  • silica brick refractory
		  • high alumina refractory
		• Hazard risk assessment which includes:
		  • Job Method Statement (JMS)
		  • Job Safety Analysis (JSA)
		  • Permit to Work (PTW)
		  • Toolbox Briefing
		• Work Planning and Scheduling which include:
		  • materials and consumables planning
		  • tools and equipment optimisation
		  • manpower assignment
			• Supervisory Skills.
			• Communication Skills.
			• Technical Writing Skills.
			• 3R concept; Reduce, Reuse, Recycle.
				Mandatory HSE Certification
				• CIDB Construction Personnel AND
				• NIOSH Oil & Gas Safety Passport AND
				• DOSH Authorised Entrant & Standby Person (AESP), if required.
				
				Competency Certification
				• CIDB SKK for Refractory Supervisor**
				
				** proposed for CIDB to develop O&G national level Sijil Kecekapan Kemahiran (SKK) programme.

19	**L2: INSULATOR**
	
	Relevant Activities:
	Maintenance
	Turnaround
	Project Works
		• Insulation application technique and their limitations which include:
		  • mineral wool such as rockwool or slag-wool
		  • calcium silicate
		• Cutting and forming metal cladding technique.
		• Maintenance and testing of insulation application tools and equipment.
			• N/A	**Mandatory HSE Certification**
				• CIDB Construction Personnel AND
				• NIOSH Oil & Gas Safety Passport AND
				• NIOSH Working at Height, if required.
				
				Competency Certification
				• CIDB SKK for Insulator**
				
				** proposed for CIDB to develop O&G national level Sijil Kecekapan Kemahiran (SKK) programme.

20	**L3: INSULATION FOREMAN**
	
	Relevant Activities:
	Maintenance
	Turnaround
	Project Works
		• Insulation construction drawings which include:
		  • piping and fittings
		  • equipment such as vessels, heat-exchangers
		• Types of insulation materials and their applications which include:
		  • mineral wool such as rockwool or slag-wool
		  • calcium silicate
		• Hazard risk assessment which includes:
		  • Job Method Statement (JMS)
		  • Job Safety Analysis (JSA)
		  • Permit to Work (PTW)
		  • Toolbox Briefing
		• Work Planning and Scheduling which include:
		  • materials and consumables planning
		  • tools and equipment optimisation
		  • manpower assignment
			• Supervisory Skills.
			• Communication Skills.
			• Technical Writing Skills.
			• 3R concept; Reduce, Reuse, Recycle.
				Mandatory HSE Certification
				• CIDB Construction Personnel AND
				• NIOSH Oil & Gas Safety Passport AND
				• NIOSH Working at Height, if required.
				
				Competency Certification
				• CIDB SKK for Insulation Foreman**
				
				** proposed for CIDB to develop O&G national level Sijil Kecekapan Kemahiran (SKK) programme.

NO	COMPETENCIES PROFILE	TECHNICAL-SKILLS	SOFT-SKILLS	CERTIFICATION PROGRAMME
21	**L2: BLASTER** Relevant Activities: Maintenance Turnaround Project Works	• Types of Abrasive Blasting. • Blasting Equipment Inspection and Maintenance. • Understanding Scheduled Waste: personal protection and disposal requirements.	• N/A	**Mandatory HSE Certification** • CIDB Construction Personnel AND • NIOSH Oil & Gas Safety Passport AND • DOSH Authorised Entry Safety Personnel (AESP), if required. **Competency Certification** • IMM-SSPC C7 Abrasive Blasting Certification OR • CIDB-CSWIP Blasting & Painting Operative OR • JPK SKM L1 Blasting Operation.
22	**L2: PAINTER** Relevant Activities: Maintenance Turnaround Project Works	• Types of Coating and Painting Application. • Coating and Painting Equipment Inspection and Maintenance. • Understanding Scheduled Waste: personal protection and disposal requirements.	• N/A	**Mandatory HSE Certification** • CIDB Construction Personnel AND • NIOSH Oil & Gas Safety Passport AND • DOSH Authorised Entry Safety Personnel (AESP), if required. **Competency Certification** • IMM-SSPC C12 Spray Application Certification OR • CIDB-CSWIP Blasting & Painting Operative OR • JPK SKM L2 Painting Operation.
23	**L3: BLASTING & PAINTING INSPECTOR** Relevant Activities: Maintenance Turnaround Project Works	• Coating Inspector Programme. • Blasting and Painting Supervision Programme. • Understanding Scheduled Waste: personal protection and disposal requirements.	• Communication Skills. • Technical Writing Skills. • 3R concept; Reduce, Reuse, Recycle.	**Mandatory HSE Certification** • CIDB Construction Personnel AND • NIOSH Oil & Gas Safety Passport AND • DOSH Authorised Entry Safety Personnel (AESP), if required. **Competency Certification** • IMM Coating Inspector L1 OR • SSPC Certified Protective Coating Inspector (PCI) OR • NACE Coating Inspector L2 OR • PCN or ASNT or ACCP Coating Inspector L1.

NO	COMPETENCIES PROFILE	TECHNICAL-SKILLS	SOFT-SKILLS	CERTIFICATION PROGRAMME

24	**L2: VALVE OVERHAULING TECHNICIAN**
	
	Relevant Activities:
	Maintenance
	Turnaround
		• Types of isolating/ regulating valves and their application which include:
		  • gate/ globe/ ball/ butterfly valve
		  • etc.
		• Types of safety/ relief valves and their application which include:
		  • Pressure relief/ safety valve (PRV or PSV)
		  • Pressure/ Vacuum valve (PVV)
		  • Thermal relief valve (TRV)
		• Maintenance, repair and testing of valves procedures.
		• Maintenance of valves repair and testing benches which include:
		  • PRV pop-test bench
		  • valve lapping block
			• N/A	**Mandatory HSE Certification**
				• CIDB Construction Personnel AND
				• NIOSH Oil & Gas Safety Passport.
				
				Competency Certification
				• CIDB SKK for Valve Overhauling Technician**
				
				** proposed for CIDB to develop O&G national level Sijil Kecekapan Kemahiran (SKK) programme.

25	**L2: ROTATING EQUIPMENT TECHNICIAN**
	
	Relevant Activities:
	Maintenance
	Turnaround
	Project Works
		• Types of pumps which include:
		  • centrifugal pump; horizontal and vertical
		  • positive displacement: screw, piston, plunger
		• Types of compressor which include:
		  • reciprocating
		  • screw
		• Pump-motor/turbine alignment.
		• Single stage pump overhaul and repair.
		• Basic troubleshooting for pumps and compressors.
			• N/A	**Mandatory HSE Certification**
				• CIDB Construction Personnel AND
				• NIOSH Oil & Gas Safety Passport.
				
				Competency Certification
				• JPK SKM L2: Rotating Equipment Maintenance Operation OR
				• CIDB SKK for Rotating Equipment Maintenance**
				
				** proposed for CIDB to develop O&G national level Sijil Kecekapan Kemahiran (SKK) programme.

26	**L3: ROTATING EQUIPMENT FOREMAN**
	
	Relevant Activities:
	Maintenance
	Turnaround
	Project Works
		• Pump-gearbox-motor/turbine alignment.
		• Multi-stage pump overhaul and repair.
		• Advance troubleshooting for pumps and compressors.
		• Hazard risk assessment which includes:
		  • Job Method Statement (JMS)
		  • Job Safety Analysis (JSA)
		  • Permit to Work (PTW)
		  • Toolbox Briefing
		• Work Planning and Scheduling which include:
		  • materials and consumables planning
		  • tools and equipment optimisation
		  • manpower assignment
			• Supervisory Skills.
			• Communication Skills.
			• Technical Writing Skills.
			• 3R concept; Reduce, Reuse, Recycle.
				Mandatory HSE Certification
				• CIDB Construction Personnel AND
				• NIOSH Oil & Gas Safety Passport.
				
				Competency Certification
				• JPK SKM L3: Rotating Equipment Maintenance Operation OR
				• CIDB SKK for Advance Rotating Equipment Maintenance**
				
				** proposed for CIDB to develop O&G national level Sijil Kecekapan Kemahiran (SKK) programme.

NO	COMPETENCIES PROFILE	TECHNICAL-SKILLS	SOFT-SKILLS	CERTIFICATION PROGRAMME
27	**L2: RE CONDITIONED- BASED MONITORING FITTER** Relevant Activities: Maintenance	• Vibration Practitioner Level-1.	• N/A	**Mandatory HSE Certification** • CIDB Construction Personnel AND • NIOSH Oil & Gas Safety Passport. **Competency Certification** • IMM Certified Vibration Practitioner Cat-1 OR • JPK SKM L2: Rotating Equipment Maintenance Operation OR • CIDB SKK for Rotating Equipment Datalogger** ** proposed for CIDB to develop O&G national level Sijil Kecekapan Kemahiran (SKK) programme.
28	**L3: RE CONDITIONED- BASED MONITORING ANALYST** Relevant Activities: Maintenance	• Vibration Practitioner Level-2.	• N/A	**Mandatory HSE Certification** • CIDB Construction Personnel AND • NIOSH Oil & Gas Safety Passport. **Competency Certification** • IMM Certified Vibration Practitioner Cat-2 OR • CIDB SKK for Rotating Equipment Analyst** ** proposed for CIDB to develop O&G national level Sijil Kecekapan Kemahiran (SKK) programme.
29	**L1: BOLTING FITTER** Relevant Activities: Maintenance Turnaround Project Works	• Hand Torque Bolted Connection Technique. • Hydraulic Torque Connection Technique.	• N/A	**Mandatory HSE Certification** • CIDB Construction Personnel AND • NIOSH Oil & Gas Safety Passport. **Competency Certification** • ECITB MJI10 Certified Mechanical Joint Integrity AND • ECITB MJI19 Certified Mechanical Joint Integrity OR • CIDB SKK for Bolting Fitter** ** proposed for CIDB to develop O&G national level Sijil Kecekapan Kemahiran (SKK) programme.
30	**L2: BOLTER** Relevant Activities: Maintenance Turnaround Project Works	• Hydraulic Tension Bolted Connection Technique.	• N/A	**Mandatory HSE Certification** • CIDB Construction Personnel AND • NIOSH Oil & Gas Safety Passport. **Competency Certification** • ECITB MJI18 Certified Mechanical Joint Integrity OR • CIDB SKK for Bolter** ** proposed for CIDB to develop O&G national level Sijil Kecekapan Kemahiran (SKK) programme.

NO	COMPETENCIES PROFILE	TECHNICAL-SKILLS	SOFT-SKILLS	CERTIFICATION PROGRAMME

31	**L3: BOLTING FOREMAN**
	
	Relevant Activities:
	Maintenance
	Turnaround
	Project Works
		• Flange Management: Controlled Bolting Training.
		• Hazard risk assessment which includes:
		  • Job Method Statement (JMS)
		  • Job Safety Analysis (JSA)
		  • Permit to Work (PTW)
		  • Toolbox Briefing
		• Work Planning and Scheduling which includes:
		  • materials and consumables planning
		  • tools and equipment optimisation
		  • manpower assignment
			• Supervisory Skills.
			• Communication Skills.
			• Technical Writing Skills.
			• 3R concept; Reduce, Reuse, Recycle.
				Mandatory HSE Certification
				• CIDB Construction Personnel AND
				• NIOSH Oil & Gas Safety Passport.
				
				Competency Certification
				• CIDB SKK for Bolting Foreman**
				
				** proposed for CIDB to develop O&G national level Sijil Kecekapan Kemahiran (SKK) programme.

32	**L4: FLANGE MANAGEMENT INSPECTOR** Relevant Activities: Maintenance Turnaround Project Works	• Flange Management: Controlled Bolting Training.	• Communication Skills. • Technical Writing Skills. • 3R concept; Reduce, Reuse, Recycle.	**Mandatory HSE Certification** • CIDB Construction Personnel AND • NIOSH Oil & Gas Safety Passport. **Competency Certification** • CIDB SKK for FM Inspector** ** proposed for CIDB to develop O&G national level Sijil Kecekapan Kemahiran (SKK) programme.
33	**L1: RADIOGRAPHIC TESTING TECHNICIAN LEVEL-1** Relevant Activities: Maintenance Turnaround Project Works	• Radiographic Testing Level-1.	N/A	**Mandatory HSE Certification** • CIDB Construction Personnel AND • NIOSH Oil & Gas Safety Passport AND • DOSH Authorised Entry Safety Personnel (AESP), if required. **Competency Certification** • MINT/ AELB (Atomic Energy Licensing Board) AND • CIDB/ TWI/ CSWIP Radiographic Testing Technician L1 OR • JPK SKM in Radiographic Testing Operation L1 OR • PCN or ASNT or ACCP Radiographic Interpreter L1.

NO	COMPETENCIES PROFILE	TECHNICAL-SKILLS	SOFT-SKILLS	CERTIFICATION PROGRAMME

34	**L2: RADIOGRAPHIC TESTING TECHNICIAN LEVEL-2**
	
	Relevant Activities:
	Maintenance
	Turnaround
	Project Works
		• Radiographic Testing Level-2.
		• Hazard risk assessment which includes:
		  • Job Method Statement (JMS)
		  • Job Safety Analysis (JSA)
		  • Permit to Work (PTW)
		  • Toolbox Briefing
		• Work Planning and Scheduling which include:
		  • materials and consumables planning
		  • tools and equipment optimisation
		  • manpower assignment
			• Supervisory Skills.
			• Communication Skills.
			• Technical Writing Skills.
			• 3R concept; Reduce, Reuse, Recycle.
				Mandatory HSE Certification
				• CIDB Construction Personnel AND
				• NIOSH Oil & Gas Safety Passport AND
				• DOSH Authorised Entry Safety Personnel (AESP), if required.
				
				Competency Certification
				• MINT/ AELB (Atomic Energy Licensing Board) AND
				• CIDB/ TWI/ CSWIP Radiographic Testing Technician L2 OR
				• JPK SKM in Radiographic Testing Operation L2 OR
				• PCN or ASNT or ACCP Radiographic Interpreter L2.

35	**L1: DYE PENETRANT TESTING TECHNICIAN LEVEL-1** Relevant Activities: Maintenance Turnaround Project Works	• Dye Penetrant Testing Level-1.	• N/A	**Mandatory HSE Certification** • CIDB Construction Personnel AND • NIOSH Oil & Gas Safety Passport AND • DOSH Authorised Entry Safety Personnel (AESP), if required. **Competency Certification** • CIDB/ TWI/ CSWIP Dye Penetrant Testing L1 OR • JPK SKM in Dye Penetrant Testing Operation L1.

36	**L2: DYE PENETRANT TESTING TECHNICIAN LEVEL-2**
	
	Relevant Activities:
	Maintenance
	Turnaround
	Project Works
		• Dye Penetrant Testing Level-2.
		• Hazard risk assessment which includes:
		  • Job Method Statement (JMS)
		  • Job Safety Analysis (JSA)
		  • Permit to Work (PTW)
		  • Toolbox Briefing
		• Work Planning and Scheduling which include:
		  • materials and consumables planning
		  • tools and equipment optimisation
		  • manpower assignment
			• Supervisory Skills.
			• Communication Skills.
			• Technical Writing Skills.
			• 3R concept; Reduce, Reuse, Recycle.
				Mandatory HSE Certification
				• CIDB Construction Personnel AND
				• NIOSH Oil & Gas Safety Passport AND
				• DOSH Authorised Entry Safety Personnel (AESP), if required.
				
				Competency Certification
				• CIDB/ TWI/ CSWIP Dye Penetrant Testing L2 OR
				• JPK SKM in Dye Penetrant Testing Operation L2

37	**L1: ULTRASONIC TESTING TECHNICIAN LEVEL-1** Relevant Activities: Turnaround Project Works	• Ultrasonic Testing Level-1.	• N/A	**Mandatory HSE Certification** • CIDB Construction Personnel AND • NIOSH Oil & Gas Safety Passport AND • DOSH Authorised Entry Safety Personnel (AESP), if required. **Competency Certification** • CIDB/ TWI/ CSWIP Ultrasonic Testing L1 OR • JPK SKM in Ultrasonic Testing Operation L1.

NO	COMPETENCIES PROFILE	TECHNICAL-SKILLS	SOFT-SKILLS	CERTIFICATION PROGRAMME

38	**L2: ULTRASONIC TESTING TECHNICIAN LEVEL-2**
	
	Relevant Activities:
	Turnaround
	Project Works
		• Ultrasonic Testing Level-2.
		• Hazard risk assessment which includes:
		  • Job Method Statement (JMS)
		  • Job Safety Analysis (JSA)
		  • Permit to Work (PTW)
		  • Toolbox Briefing
		• Work Planning and Scheduling which include:
		  • materials and consumables planning
		  • tools and equipment optimisation
		  • manpower assignment
			• Supervisory Skills.
			• Communication Skills.
			• Technical Writing Skills.
			• 3R concept; Reduce, Reuse, Recycle.
				Mandatory HSE Certification
				• CIDB Construction Personnel AND
				• NIOSH Oil & Gas Safety Passport AND
				• DOSH Authorised Entry Safety Personnel (AESP), if required.
				
				Competency Certification
				• CIDB/ TWI/ CSWIP Ultrasonic Testing L2 OR
				• JPK SKM in Ultrasonic Testing Operation L2.

39	**L1: EDDY CURRENT TESTING TECHNICIAN LEVEL-1** Relevant Activities: Turnaround Project Works	• Eddy Current Testing Level-1.	• N/A	**Mandatory HSE Certification** • CIDB Construction Personnel AND • NIOSH Oil & Gas Safety Passport AND • DOSH Authorised Entry Safety Personnel (AESP), if required. **Competency Certification** • CIDB/ TWI/ CSWIP Eddy Current Testing L1 OR • JPK SKM in Eddy Current Testing Operation L1.

40	**L2: EDDY CURRENT TESTING TECHNICIAN LEVEL-2**
	
	Relevant Activities:
	Turnaround
	Project Works
		• Eddy Current Testing Level-2.
		• Hazard risk assessment which includes:
		  • Job Method Statement (JMS)
		  • Job Safety Analysis (JSA)
		  • Permit to Work (PTW)
		  • Toolbox Briefing
		• Work Planning and Scheduling which include:
		  • materials and consumables planning
		  • tools and equipment optimisation
		  • manpower assignment
			• Supervisory Skills.
			• Communication Skills.
			• Technical Writing Skills.
			• 3R concept; Reduce, Reuse, Recycle.
				Mandatory HSE Certification
				• CIDB Construction Personnel AND
				• NIOSH Oil & Gas Safety Passport AND
				• DOSH Authorised Entry Safety Personnel (AESP), if required.
				
				Competency Certification
				• CIDB/ TWI/ CSWIP Eddy Current Testing L2 OR
				• JPK SKM in Eddy Current Testing Operation L2.

41	**L1: MAGNETIC PARTICLE TESTING TECHNICIAN LEVEL-1** Relevant Activities: Turnaround Project Works	• Magnetic Particle Testing Level-1.	• N/A	**Mandatory HSE Certification** • CIDB Construction Personnel AND • NIOSH Oil & Gas Safety Passport AND • DOSH Authorised Entry Safety Personnel (AESP), if required. **Competency Certification** • CIDB/ TWI/ CSWIP Magnetic Particle Testing L1 OR • JPK SKM in Magnetic Particle Testing Operation L1.

NO	COMPETENCIES PROFILE	TECHNICAL-SKILLS	SOFT-SKILLS	CERTIFICATION PROGRAMME
42	**L1: MAGNETIC PARTICLE TESTING TECHNICIAN LEVEL-1** Relevant Activities: Turnaround Project Works	• Magnetic Particle Testing Level-1.	• N/A	**Mandatory HSE Certification** • CIDB Construction Personnel AND • NIOSH Oil & Gas Safety Passport AND • DOSH Authorised Entry Safety Personnel (AESP), if required. **Competency Certification** • CIDB/ TWI/ CSWIP Magnetic Particle Testing L1 OR • JPK SKM in Magnetic Particle Testing Operation L1.

43	**L2: MAGNETIC PARTICLE TESTING TECHNICIAN LEVEL-2**
	
	Relevant Activities:
	Turnaround
	Project Works
		• Magnetic Particle Testing Level-2.
		• Hazard risk assessment which includes:
		  • Job Method Statement (JMS)
		  • Job Safety Analysis (JSA)
		  • Permit to Work (PTW)
		  • Toolbox Briefing
		• Work Planning and Scheduling which include:
		  • materials and consumables planning
		  • tools and equipment optimisation
		  • manpower assignment
			• Supervisory Skills.
			• Communication Skills.
			• Technical Writing Skills.
			• 3R concept; Reduce, Reuse, Recycle.
				Mandatory HSE Certification
				• CIDB Construction Personnel AND
				• NIOSH Oil & Gas Safety Passport AND
				• DOSH Authorised Entry Safety Personnel (AESP), if required.
				
				Competency Certification
				• CIDB/ TWI/ CSWIP Magnetic Particle Testing L2 OR
				• JPK SKM in Magnetic Particle Testing Operation L2.

44	**L2: WIREMAN** Relevant Activities: Maintenance Turnaround Project Works	• ST -PW1: single phase wiring. • ST -PW4: three phase wiring. • ST Electricity Regulations 1994. • Hazardous Area Classification and Control of Ignition Sources. • Safety markings and signagesignage. • Lock-Out tag-Out (LOTO) system. • Electrical safety and electrical hazards.	• N/A	**Mandatory HSE Certification** • CIDB Construction Personnel AND • NIOSH Oil & Gas Safety Passport. **Competency Certification** • ST/EIU Competency Certificate AND • IEC Ex 001 Basic Principles of Protection AND • IEC Ex 003 Equipment & Wiring System OR • JPK SKK L2 Electrical Wireman.

NO	COMPETENCIES PROFILE	TECHNICAL-SKILLS	SOFT-SKILLS	CERTIFICATION PROGRAMME

45	**L3: ELECTRICAL TECHNICIAN**
	
	Relevant Activities:
	Maintenance
	Turnaround
		• Hazardous Area Classification and Control of Ignition Sources.
		• Intrinsically-safe (IS) equipment/ apparatus.
		• Understanding types protection which include:
		  • Flameproof: Ex(d)
		  • Non Sparking Ex(n)
		  • Intrinsically Safe: Ex(i)
		  • Increased Safety: Ex(e)
		• Safety markings and signagesignage.
		• Repair, overhaul and service for electrical motor.
		• Electrical Testing which includes:
		  • relay
		  • insulation of coil
		  • resistance test
		  • earthing
		• Application and procedures of testing tools which include:
		  • Infrared Thermographer
		  • Vibration Tester
		  • Airborne Ultrasound
			• Supervisory Skills.
			• Communication Skills.
			• Technical Writing Skills.
			• 3R concept; Reduce, Reuse, Recycle.
				Mandatory HSE Certification
				• CIDB Construction Personnel AND
				• NIOSH Oil & Gas Safety Passport.
				
				Competency Certification
				• ST/EIU Competency Certificate AND
				• IEC Ex 001 Basic Principles of Protection AND
				• IEC Ex 003 Equipment & Wiring System AND
				• IEC Ex 004 Maintenance of Electrical Equipment, if required AND
				• IEC Ex 005 Repair, Overhaul and Services for Motor/ Rotating Equipment, if required AND
				• IEC Ex 006 Testing Electrical Installation, if required.

46	**L3: ELECTRICAL IEC EX TECHNICIAN**
	
	Relevant Activities:
	Project Works
		• Hazardous Area Classification and Control of Ignition Sources.
		• Intrinsically-safe (IS) equipment/ apparatus.
		• Understanding types protection which include:
		  • Flameproof: Ex(d)
		  • Non Sparking Ex(n)
		  • Intrinsically Safe: Ex(i)
		  • Increased Safety: Ex(e)
		• Hazard risk assessment which includes:
		  • Job Method Statement (JMS)
		  • Job Safety Analysis (JSA)
		  • Permit to Work (PTW)
		  • Toolbox Briefing
		  • Safety markings and signagesignage.
			• Supervisory Skills.
			• Communication Skills.
			• Technical Writing Skills.
			• 3R concept; Reduce, Reuse, Recycle.
				Mandatory HSE Certification
				• CIDB Construction Personnel AND
				• NIOSH Oil & Gas Safety Passport.
				
				Competency Certification
				• ST/EIU Competency Certificate AND
				• IEC Ex 001 Basic Principles of Protection AND
				• IEC Ex 003 Equipment & Wiring System AND
				• IEC Ex 004 Maintenance of Electrical Equipment, if required AND
				• IEC Ex 005 Repair, Overhaul and Services for Motor/ Rotating Equipment, if required AND
				• IEC Ex 006 Testing Electrical Installation.

NO	COMPETENCIES PROFILE	TECHNICAL-SKILLS	SOFT-SKILLS	CERTIFICATION PROGRAMME

47	**L4: ELECTRICAL IEC EX INSPECTOR**
	
	Relevant Activities:
	Project Works
		• Electrical inspection.
		• Wiring/ cabling and cable glanding.
		• Basic area classification and gas groups.
		• Equipment protection level which includes:
		  • Flameproof: Ex(d)
		  • Non Sparking Ex(n)
		  • Intrinsically Safe: Ex(i)
		  • Increased Safety: Ex(e)
		• Types and application of Ingress Protection (IP) equipment.
		• Safety markings and signage.signage.
			• Supervisory Skills.
			• Communication Skills.
			• Technical Writing Skills.
			• 3R concept; Reduce, Reuse, Recycle
				Mandatory HSE Certification
				• CIDB Construction Personnel AND
				• NIOSH Oil & Gas Safety Passport.
				
				Competency Certification
				• ST/EIU Competency Certificate AND
				• IEC Ex 001 Basic Principles of Protection AND
				• IEC Ex 007 Visual & Close Inspection AND
				• IEC Ex 008 Detailed Inspection.

48	**L2: FIELD INSTRUMENT FITTER**
	
	Relevant Activities:
	Maintenance
	Turnaround
	Project Works
		• Hazardous Area Classification and Control of Ignition Sources.
		• Wiring/ cabling and cable glanding.
		• Principles of field instruments and measurements.
		• Installation and termination of field instruments which include:
		  • tubing
		  • compression fittings
		• Installation and testing of equipment which include:
		  • transmitters/ gauges for pressure, temperature or flow
		  • control valve including actuator
		• Safety markings and signage.signage.
			• N/A	**Mandatory HSE Certification**
				• CIDB Construction Personnel AND
				• NIOSH Oil & Gas Safety Passport.
				
				Competency Certification
				• IEC Ex 001 Basic Principles of Protection AND
				• IEC Ex 003 Equipment & Wiring System, if required.

49	**L3: FIELD INSTRUMENT TECHNICIAN**
	
	Relevant Activities:
	Maintenance
	Turnaround
	Project Works
		• Hazardous Area Classification and Control of Ignition Sources.
		• Intrinsically-safe (IS) equipment/ apparatus.
		• Understanding types protection which include:
		  • Flameproof: Ex(d)
		  • Non Sparking Ex(n)
		  • Intrinsically Safe: Ex(i)
		  • Increased Safety: Ex(e)
		• Principles of field instruments and measurements.
		• Testing and calibration of field instruments and control valves.
		• Repair of field instruments and control valves.
		• Hazard risk assessment which includes:
		  • Job Method Statement (JMS)
		  • Job Safety Analysis (JSA)
		  • Permit to Work (PTW)
		  • Toolbox Briefing
		• Safety markings and signagesignage.
			• Supervisory Skills.
			• Communication Skills.
			• Technical Writing Skills.
			• 3R concept; Reduce, Reuse, Recycle.
				Mandatory HSE Certification
				• CIDB Construction Personnel AND
				• NIOSH Oil & Gas Safety Passport.
				
				Competency Certification
				• IEC Ex 001 Basic Principles of Protection AND
				• IEC Ex 003 Equipment & Wiring System AND
				• IEC Ex 004 Maintenance of Electrical Equipment, if required AND
				• IEC Ex 006 Testing Electrical Installation.

NO	COMPETENCIES PROFILE	TECHNICAL-SKILLS	SOFT-SKILLS	CERTIFICATION PROGRAMME

50	**L4: FIELD INSTRUMENTATION INSPECTOR**
	
	Relevant Activities:
	Maintenance
	Turnaround
		• Field instrumentation and control inspection.
		• Wiring/ cabling and cable glanding.
		• Equipment protection level.
		• Basic area classification and gas groups.
		• Equipment protection level which includes:
		  • Flameproof: Ex(d)
		  • Non Sparking Ex(n)
		  • Intrinsically Safe: Ex(i)
		  • Increased Safety: Ex(e)
		• Types and application of Ingress Protection (IP) equipment.
		• Safety markings and signage.signage.
			• Supervisory Skills.
			• Communication Skills.
			• Technical Writing Skills.
			• 3R concept; Reduce, Reuse, Recycle.
				Mandatory HSE Certification
				• CIDB Construction Personnel AND
				• NIOSH Oil & Gas Safety Passport.
				
				Competency Certification
				• IEC Ex 001 Basic Principles of Protection AND
				• IEC Ex 007 Visual & Close Inspection AND
				• IEC Ex 008 Detailed Inspection AND
				• IEC Ex 009 Design Installation Electrical, if required

51	**L3: SGS INSTRUMENTATION TECHNICIAN**
	
	Relevant Activities:
	Maintenance
	Turnaround
		• Hazardous Area Classification and Control of Ignition Sources.
		• Intrinsically-safe (IS) equipment/ apparatus.
		• Safeguarding System (SGS) which includes:
		  • functional logics
		  • system testing
		• Cause & Effects Matrix.
		• Safety markings and signage.signage.
			• Supervisory Skills.
			• Communication Skills.
			• Technical Writing Skills.
			• 3R concept; Reduce, Reuse, Recycle.
				Mandatory HSE Certification
				• CIDB Construction Personnel AND
				• NIOSH Oil & Gas Safety Passport.
				
				Competency Certification
				• IEC Ex 001 Basic Principles of Protection AND
				• IEC Ex 003 Equipment & Wiring System, if required

52	**L3: DCS INSTRUMENTATION TECHNICIAN**
	
	Relevant Activities:
	Maintenance
	Turnaround
		• Hazardous Area Classification and Control of Ignition Sources.
		• Intrinsically-safe (IS) equipment/ apparatus.
		• Distributed Control Systems (DCS) which includes:
		  • functional logics
		  • system testing
		• Cause & Effects Matrix.
		• Safety markings and signage.signage.
			• Supervisory Skills.
			• Communication Skills.
			• Technical Writing Skills.
			• 3R concept; Reduce, Reuse, Recycle.
				Mandatory HSE Certification
				• CIDB Construction Personnel AND
				• NIOSH Oil & Gas Safety Passport.
				
				Competency Certification
				• IEC Ex 001 Basic Principles of Protection AND
				• IEC Ex 003 Equipment & Wiring System, if required.

53	**L2: QMI FITTER**
	
	Relevant Activities:
	Maintenance
	Turnaround
	Project Works
		• Hazardous Area Classification and Control of Ignition Sources.
		• Wiring/ cabling and cable glanding.
		• Principles of field instruments and measurements.
		• Installation and termination of field instruments which includes:
		  • tubing
		  • compression fittings
		• Installation and testing of equipment which include:
		  • flow meters
		  • transmitters
		• Safety markings and signage.signage.
			• N/A	**Mandatory HSE Certification**
				• CIDB Construction Personnel AND
				• NIOSH Oil & Gas Safety Passport.
				
				Competency Certification
				• IEC Ex 001 Basic Principles of Protection AND
				• IEC Ex 003 Equipment & Wiring System, if required, AND
				• IEC Ex 004 Maintenance of Electrical Equipment, if required, AND
				• IEC Ex 006 Testing Electrical Installation, if required.

NO	COMPETENCIES PROFILE	TECHNICAL-SKILLS	SOFT-SKILLS	CERTIFICATION PROGRAMME

54	**L3: QMI TECHNICIAN**
	
	Relevant Activities:
	Maintenance
	Turnaround
	Project Works
		• Hazardous Area Classification and Control of Ignition Sources.
		• Intrinsically-safe (IS) equipment/ apparatus.
		• Basic area classification and gas groups.
		• Equipment protection level which includes:
		  • Flameproof: Ex(d)
		  • Non Sparking Ex(n)
		  • Intrinsically Safe: Ex(i)
		  • Increased Safety: Ex(e)
		• Types and application of Ingress Protection (IP) equipment.
		• Quality Measuring Instrument (QMI) testing and calibration which include:
		  • meters
		  • custom custody
		• Safety markings and signage.signage.
			• Supervisory Skills.
			• Communication Skills.
			• Technical Writing Skills.
			• 3R concept; Reduce, Reuse, Recycle
				Mandatory HSE Certification
				• CIDB Construction Personnel AND
				• NIOSH Oil & Gas Safety Passport.
				
				Competency Certification
				• IEC Ex 001 Basic Principles of Protection AND
				• IEC Ex 003 Equipment & Wiring System, if required, AND
				• IEC Ex 007 Visual & Close Inspection, if required, AND
				• IEC Ex 008 Detailed Inspection.

LIST OF ABBREVIATIONS

ACCP	Amorphous Carbonated Ca-P
AESP	Authorised Entrant & Standby Person
ASME	American Society of Mechanical Engineers
ASNT	American Society for Non-Destructive Testing
CG	Centre of Gravity
CIDB	Construction Industry Development Board
DCS	Distributed Control System
DOSH	Department of Occupational Safety and Health
DPT	Dye Penetrant Test
DT	Destructive Test
ECT	Eddy-current Testing
EIU	Electrical Inspectorate Unit
EPF	Employee Provident Fund
EPU	Economic Planning Unit
FCAW	Flux Core Arc Welding
GMAW	Gas Metal Arc Welding
GTAW	Gas Tungsten Arc Welding
HRDF	Human Resource Development Fund
HSE	Health, Safety & Environment
IEC	International Electrochemical Comission
IECEx	International Electrochemical Commission (Explosive)
IMM	Institute of Materials Malaysia
IP	Ingress Protection
IPF	Instrumented Protective Function
IPP	Independent Power Producer
ISF	Industrial Skills Framework
JMS	Job Method Statement
JPK	Jabatan Pembangunan Kemahiran
JSA	Job Safety Analysis
LOTO	Lock-Out, Tag-Out
MESTECC	Ministry of Energy, Science, Technology, Environment & Climate Change
MICCI	Malaysian International Chamber Of Commerce & Industry
MICCI-PPSC	Malaysian International Chamber Of Commerce & Industry - Petroleum Producers Standing Committee
MOGSC	Malaysia Oil & Gas Services Council
MPM	Malaysia Petroleum Management
MPT	Magnetic Particle Test
NACE	National Association of Corrosion Engineers
NDE	Non-Destructive Examination
NDT	Non-Destructive Testing
NIOSH	National Institute of Occupational Safety & Health

NOSS	National Occupational Skills Standards
NRV	Non-return Valve
O&G	Oil and Gas
OGE	Oil, Gas & Energy
P&ID	Piping & Instrument Diagram
PAC	Petroleum Arrangement Contractor
PCI	Protective Coating Inspector
PCN	Personnel Certification in Non-Destructive Testing
PLC	Programmable Logic Controller
PMA	Perakuan Mesin Angkat
PNB	Permodalan Nasional Berhad
PQR	Procedure Qualification Record
PSV	Pressure Safety Valve
PTW	Permit to Work
QMI	Quality Measuring Instruments
RE	Rotating Equipment
RT	Radiography Test
SAW	Submerged Arc Welding
SGS	Safeguarding system
SKK	Sijil Kecekapan Kemahiran
SKM	Sijil Kemahiran Malaysia
SMAW	Shielded Metal Arc Welding
SSPC	Society for Protective Coatings
ST	Suruhanjaya Tenaga
STC	Sectorial Training Committee
SWL	Safe Working Load
TNB	Tenaga Nasional Berhad
UT	Ultrasonic Test
WPS	Welding Procedure Specification
WQT	Welding Qualification Test

NOTES

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