



Pipeline engineer competency standards list: onshore sector

**Grey shaded competencies not yet available

ID	Competency area/Competency	Gen	Des	Cons	Ops	Level
General engineering						
GE001	Engineering degree in a relevant discipline	x				Core
GE002	Pipeline engineering fundamentals	x				Core
GE003	Mechanics (statics and dynamics) - bridging	x				Core
GE004	Structures - bridging	x				Core
GE005	Process engineering - bridging	x				Core
GE006	Soil mechanics - bridging	x				Core
GE007	Fluid mechanics (hydraulics) - bridging	x				Core
GE008	Materials - bridging	x				Core
GE009	Principles of corrosion - bridging	x				Core
GE010	Basic electricity and electronics - bridging	x				Core
GE011	Basic instrumentation and controls - bridging	x				Core
GE012	Technical governance	x				Core
GE013	Flexible pipe design	x				Core
Industry Background						
IB001	Industry participants and structure	x				Core
IB002	Introduction to AS 2885	x				Core
IB003	Related industries	x				Core
IB004	Legal and regulatory frameworks for pipeline engineers	x				Core
IB005	Introduction to plastics pipe and water and gas industry standards	x				Core
Corrosion Control						
CC001	Corrosion control fundamentals		x		x	Core
CC002	Cathodic protection systems		x		x	Elective
CC003	Pipe coatings		x		x	Elective
CC004	External corrosion failure mechanisms		x		x	Elective
CC005	Dosing systems design and operation		x	x	x	Elective
CC006	LFI, earthing and fault current		x	x	x	Elective
CC007	Pipeline coating inspection and assessment				x	Elective
CC008	Internal corrosion failure mechanisms		x		x	Elective
Instruments and Controls						
IC001	Instrument and control fundamentals		x			Core
IC002	Pipeline pressure control		x		x	Elective
IC003	Communications systems – voice and data		x		x	Elective
IC004	Pipeline control systems		x		x	Elective
IC005	Power supplies		x		x	Elective
IC006	CHAZOP, HIPPS, ESD, SIL determinations and requirements		x		x	Elective

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IC007	Field instrumentation		x		x	Elective
IC008	Leak detection systems		x		x	Specialist
IC009	Metering and measurement systems		x		x	Elective
IC010	Control valves and control valve actuators		x		x	Elective
IC011	Hazardous area classification and design		x		x	Elective
IC012	Hazardous area installation and maintenance		x		x	Elective
IC013	Hazardous area verification dossiers		x		x	Elective
IC014	Gas quality monitoring systems		x		x	Elective
IC015	Safety systems ie fusible loops, fire & smoke detection, dump systems		x		x	Elective
Risk Assessment						
RA001	Risk assessment fundamentals		x		x	Core
RA002	Risk assessment		x		x	Elective
RA003	HAZOP, HAZID		x		x	Elective
RA004	Location classification		x		x	Elective
RA005	Safety management studies		x		x	Elective
RA006	Hazardous area assessment		x	x	x	Elective
RA007	Consequence assessment (modelling of plume dispersion, spills, radiation, noise, etc)		x		x	Elective
Work Health and Safety Management						
SM001	Work health and safety fundamentals		x	x	x	Core
SM002	Health and safety regulations		x		x	Elective
SM003	Construction risk assessment			x		Elective
SM004	Safety management plans - construction			x		Elective
SM005	Safety management systems				x	Elective
SM006	Work permits, lockouts, maintenance safety controls			x	x	Elective
SM007	Fatigue management			x	x	Elective
SM008	Safe vehicle transport			x	x	Elective
SM009	Working in remote areas			x	x	Elective
SM010	Emergency planning and response			x	x	Elective
SM011	Construction safety training and cards			x		Elective
Commercial Aspects						
CA001	Commercial aspects fundamentals	x				Core
CA002	Pipeline capital cost estimation			x	x	Elective
CA003	Operations and maintenance cost estimation				x	Elective
CA004	Economic regulation				x	Elective
Environment and heritage						
EH001	Environment and heritage fundamentals	x				Core
EH002	Environment and cultural heritage legislation and approvals processes		x	x		Elective
EH003	Land stakeholder management		x	x		Elective
EH004	Environment and cultural heritage management plans		x	x		Elective

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EH006	APGA Code of Environmental Practice			x		Elective
EH007	Environment and cultural heritage management during construction			x		Elective
EH008	Environment and cultural heritage management during operations				x	Elective
ROW acquisition and management						
EA001	ROW acquisition and management fundamentals	x				Core
EA003	Landowner negotiations and relationship		x	x		Elective
EA004	Native and Aboriginal title management during construction		x	x		Elective
EA006	Land owner management during construction			x		Elective
EA007	Land owner management during operations				x	Elective
Design of onshore pipelines						
DP001	AS 2885.1 – Key concepts and application		x	x	x	Core
DP002	Onshore pipeline design fundamentals		x			Core
DP003	Pipeline hydraulics modelling - steady state		x			Elective
DP004	Pipeline hydraulics modelling - transient		x		x	Specialist
DP005	Pipeline component specification		x			Elective
DP006	Wall thickness and design pressure		x			Elective
DP007	Pipeline design basis preparation		x			Elective
DP008	Linepipe specification		x			Elective
DP009	Alignment sheet engineering		x			Elective
DP010	Crossings and typical designs		x			Elective
DP011	External interference protection		x		x	Elective
DP012	Pipeline assemblies, supports and anchors		x			Elective
DP013	Stress analysis		x			Elective
DP014	Fracture control - <i>foundational</i>		x			Elective
DP015	Low temperature and high temperature design		x			Elective
DP017	Fatigue analysis		x			Elective
DP018	Design for pipeline installation		x			Elective
DP019	Pipeline communications & control - design overview		x			Elective
DP021	Soil mechanics for pipeline design		x		x	Elective
DP022	Technical support for procurement		x			Elective
DP023	Line pipe inspection		x			Elective
DP024	Line pipe mill negotiation		x	x		Elective
DP025	Horizontal directional drilling - design		x			Elective
DP026	Buoyancy control		x			Elective
DP027	Technical Support for procurement – construction services		x	x	x	Elective

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DP028	Technical Support for procurement – engineering service		x	x	x	Elective
DP030	Fracture control – advanced		x			Specialist
Design of stations						
DS001	Station design fundamentals		x		x	Core
DS002	Station engineering - general principles		x		x	Elective
DS003	Station piping (inc. AS 4041 & B31.3)		x		x	Elective
DS004	Compressor stations		x		x	Elective
DS006	Pumps and pumping installations		x		x	Elective
DS007	Pressure vessels		x		x	Elective
DS008	Generators		x		x	Elective
DS009	Pressure and flow regulation and over-pressure protection systems		x		x	Elective
DS010	Separators and filters		x		x	Elective
DS012	Heaters		x		x	Elective
DS013	Odorant dosing systems		x		x	Elective
Route engineering & easement maintenance						
RE001	Route engineering fundamentals		x		x	Core
RE002	Alignment permitting, licensing and approvals processes		x		x	Elective
RE004	GIS and survey		x		x	Elective
RE005	Use of remote sensing tools		x		x	Elective
RE006	Geohazard and geotechnical assessment		x		x	Elective
RE008	Route selection		x	x		Elective
Construction engineering & management						
CE001	Construction engineering & management fundamentals			x		Core
CE002	Construction equipment			x		Core
CE003	Planning & documentation			x		Elective
CE005	Quality assurance and quality control			x		Elective
CE006	Pipeline crossing construction		x	x		Elective
CE008	Drainage, erosion and sediment control			x		Elective
CE009	Horizontal directional drilling – construction			x		Elective
CE010	Field bending			x		Elective
CE012	Logistics			x		Elective
CE013	Facilities construction			x		Elective

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CE016	Pre-commissioning			x		Elective
CE018	Soil mechanics for pipeline construction			x	x	Elective
CE019	Final project documentation		x	x		Elective
CE020	Managing a pipeline spread			x		Elective
Pipeline project management						
PM001	Pipeline project management fundamentals		x	x		Core
PM002	Pipeline project engineering		x	x		Elective
Welding						
W001	Welding fundamentals	x				Core
W002	AS2885.2 - Key concepts and application		x	x	x	Core
W003	AS 3992 and ASME IX - Key concepts and application		x	x	x	Core
W004	Weld procedure management		x	x	x	Elective
W005	Welding of in-service pipelines		x	x	x	Elective
W006	Production welding		x	x	x	Elective
W007	Weld inspection, examination and testing			x	x	Elective
Hydrotest, commissioning and preparation for operation						
HC001	Hydrotesting, commissioning and prep for operations fundamentals		x	x	x	Core
HC002	Hydrotest design and planning		x	x		Elective
HC003	Pipeline commissioning		x	x	x	Elective
HC005	Hydrotest execution					
HC006	Preparation for operations		x	x	x	Elective
Asset management - technical						
AM001	AS 2885.3 – key concepts and application				x	Core
AM002	Asset management - technical fundamentals				x	Core
AM003	Maintenance planning and execution				x	Elective
AM004	Managing and leading pipeline operations and maintenance staff				x	Elective
AM005	Maintenance of pipeline instrumentation and controls				x	Elective
AM006	Pipeline control system maintenance and upgrade				x	Elective
AM007	Communications operation and maintenance				x	Elective
AM008	Asset management planning				x	Elective
AM009	Right of way maintenance				x	Elective
AM010	Operational corrosion protection				x	Elective
AM011	Scraper station and min line valve maintenance				x	Elective
AM012	Compressor station maintenance				x	Elective
AM013	MAOP review				x	Elective

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AM015	Location class review				x	Elective
AM016	Safety management study review				x	Elective
AM017	Suspension				x	Elective
AM019	Compressor package maintenance - centrifugal				x	Elective
AM020	Compressor package maintenance - reciprocating				x	Elective
AM021	Pump package maintenance				x	Elective
AM022	Supporting services and equipment maintenance				x	Elective
AM023	Electrical ancillary equipment operation and maintenance				x	Elective
AM024	Mechanical ancillary equipment maintenance				x	Elective
AM025	Odorant plant maintenance				x	Elective
AM026	Hazardous area system maintenance				x	Elective
AM027	Pressure control and over-pressure protection systems review				x	Elective
AM028	Remaining life review				x	Elective
AM029	Pipeline integrity management plans				x	Elective
AM030	Meter/regulator station maintenance				x	Elective
AM031	MAOP upgrade		x		x	Elective
AM032	Abandonment				x	Elective
AM033	Linepipe anomaly investigation and inspection				x	Elective
AM034	Stress corrosion cracking				x	Specialist
AM035	Pipeline crossings and interactions				x	Elective
AM036	Change management				x	Elective
Pipeline operations						
OP001	Pipeline operation fundamentals				x	Core
OP002	Operating and design conditions				x	Elective
OP003	Pipeline control - gas				x	Elective
OP004	Pipeline modelling for gas pipeline systems				x	Specialist
OP005	Billing - gas				x	Elective
OP006	Pipeline repairs fundamentals				x	Core
OP007	Planning in-service repairs				x	Elective
OP008	Line pipe repair systems				x	Elective
OP009	Hot tapping and stoppling				x	Elective
OP010	Gas scheduling				x	Elective
OP011	Compressor operation – centrifugal				x	Elective
OP012	Meter station operation				x	Elective
OP013	Emergency exercises, simulation and planning				x	Elective
OP014	In-line inspection				x	Elective
OP015	Liquid flow enhancers				x	Elective
OP018	Emissions monitoring				x	Elective

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OP021	Coating repairs				x	Elective
OP022	Pipeline control – liquids, single product				x	Elective
OP023	Managing contaminants and impurities – gas				x	Elective
OP024	Compressor operation – reciprocating				x	Elective
OP025	Pump station operation				x	Elective
OP026	Operational and maintenance pigging				x	Elective
OP027	Incident investigation, assessment and reporting				x	Elective
OP028	Managing contaminants and impurities – liquids				x	Elective
OP029	Venting, purging and pressurising				X	Elective
Pipeline management systems						
PS001	Pipeline management systems fundamentals				x	Core
PS002	Developing and reviewing a pipeline management system				x	Elective
PS003	Regulatory compliance and compliance systems				x	Elective
PS004	Pipeline management system audit				x	Elective
Plastics pipe						
PP001	Key concepts in standards for design, construction and operation of plastics pipe		x	x	x	Core
PP002	Fundamentals of plastics pipe design		x			Core
PP003	Elevated temperature design for plastics pipe		x			Elective
PP004	Cyclic loading design		x			Elective
PP005	Low temperature plastics pipe design		x			Elective
PP006	Design and planning for hydrotest for plastics pipe		x			Elective
PP007	Execution of hydrotest for plastics pipe			x		Elective
PP008	Fundamentals of plastics pipe construction			x		Core
PP009	Construction - quality assurance and quality control in plastics pipe			x		Elective
PP010	Construction - trenchless technology in plastics pipe			x		Elective
PP011	Construction - curving plastics pipe			x		Elective
PP012	Welding and jointing for plastics pipe fundamentals		x	x	x	Core
PP013	Construction - welding and installation and inspection and NDT for plastics pipe			x		Elective
PP014	Asset management for plastics pipe				x	Elective
PP015	Fundamentals of operation of plastic pipe systems				x	Core
PP016	Pipeline operations - control for plastics pipe				x	Elective
PP017	Pipeline operations - repair for plastics pipe				x	Elective
PP018	Pipeline operations - hot tapping for plastics pipe				x	Elective
PP019	Plough-in - design and construction		x	x		Elective
Composite pipe						
CP001	Composite pipe fundamentals		x	x	x	Core
CP002	Single-layer, rigid, jointed pipe design		x			Elective
CP003	Single-layer, rigid, jointed pipe construction			x		Elective

ID	Competency area/Competency	Gen	Des	Cons	Ops	Level
CP004	Single-layer, rigid, jointed pipe operations and maintenance				x	Elective
CP005	Multilayer spoolable pipe design		x			Elective
CP006	Multilayer spoolable pipe construction			x		Elective
CP007	Multilayer spoolable pipe operations and maintenance				x	Elective