

Samples of APEGA Defined Scopes of Practice

Professional Licensee(Engineering)

CHEMICAL ENGINEERING

Within the discipline of Chemical Engineering; in the field of oil and gas exploration and production:

-Evaluating, reporting on and advising on; the feasibility and performance in the production, development and maintenance of oil and gas wells

-Designing type curve models, well workover programs, Enhanced Oil Recovery (EOR) Systems, pumping and compression systems used in the production, development and maintenance of oil and gas wells

-Preparing plans and specifications for long and short term planning for fracture communication and mitigation systems used in the production, development and maintenance of oil and gas wells.

Within the discipline of Chemical Engineering; in the field of natural gas processing and treating facilities:

-Evaluating, reporting on, advising on, directing the operation of, preparing plans and specifications for: amine treating, glycol dehydration and dewpoint control units in natural gas processing facilities.

Within the discipline of Chemical Engineering; in the field of oil and gas operations:

-Reporting on, advising on, evaluating: modelling the release of hydrocarbons from oil and gas processing equipment,

-Advising on, evaluating: fire and gas detection systems for oil and gas facilities,

-Reporting on, advising on, evaluating and designing: building egress fire and safety equipment layouts used in oil and gas facilities.

Within the discipline of Chemical Engineering; in the field of oil and gas operations:

-Designing sweet oil pipeline gathering systems to a maximum of 9930 kPag

-Designing water injection pipelines operating less than 15 MPa

-Designing sweet crude oil pump stations not exceeding 10204 kPag operating pressure

-Designing multi-well oil batteries

-Designing single and multi-well satellite and facility

-Designing relief system design for crude oil batteries and crude oil pump stations

The scope excludes: civil and structural design, sour oil and gas gathering pipeline and pump stations systems, oil sands, compressor stations design, gas plant design, oil upgrading or refinery design, major gas or oil transport pipeline systems.

CHEMICAL ENGINEERING CONT'D

Within the discipline of Chemical Engineering; in the field of oil and gas operations:

Designing, preparing plans and specifications for, advising on, directing the construction of, and evaluating: sweet/sour oil and gas pipelines, single and multi-well oil and gas batteries, pad sites, satellites, water injection wells, tank farms, and compressor stations

Within the discipline of Chemical Engineering; in the field of heavy oil operations:

- **Designing and preparing plans and specifications for** pump and piping systems, and for atmospheric storage tanks
- **Evaluating and designing** process flow diagrams, piping and instrumentation diagrams and related heat and mass balances
- **Preparing plans and specifications for** vapour/liquid separation vessels

Within the discipline of Chemical Engineering; in the field of oil and gas operations:

- **Directing the operation of** oil & gas processing facilities and equipment to optimize, operate efficiently and within safe limits
- **Designing** piping systems, separation equipment, and relief systems in oil and gas production facilities and wellsites
- **Preparing plans and specifications for** piping systems, separation equipment, and relief systems in oil and gas production facilities and wellsites

Within the discipline of Chemical Engineering; in the field of oil and gas operations:

Evaluating sulphur recovery and tail gas treating units within the oil and gas industry.

CIVIL ENGINEERING

Within the discipline of Civil Engineering; in the field of oil and gas operations and power plant facilities:

- **Designing and preparing plans and specifications for** structural steel supports and concrete pads and concrete foundations, to support mechanical equipment and pipes and electrical equipment, cable trays and conduits.

The scope excludes: design for dynamic loading

Within the discipline of Civil Engineering; in the field of roadway infrastructure:

- **Reporting on, advising on, evaluating, designing:** traffic control at new and existing signalized intersections including traffic signals, signage and operation and related systems

- **Directing the construction of, directing the technical inspection of:** traffic control at new and existing signalized intersections including traffic signals, signage, poles, bases, underground duct work, wiring and related systems

- **Directing the operation of:** advanced traffic management systems including central mainframe systems and PC based closed loop systems and related systems.

The scope excludes: Design of traffic signal foundations and traffic signal poles.

Within the discipline of Civil Engineering; in the field of building design:

-**Reporting on, advising on, evaluating and directing the technical inspection of:** construction, renovation and repair of residential, commercial and industrial low-rise and mid-rise buildings up to and including 5 storeys.

-**Reporting on, advising on, evaluating, designing, preparing plans and specifications for and directing the technical inspection of:** building components limited to steel studs, wood studs, equipment support frames, railings, guard rails, masonry and cladding connections for industrial, commercial, and residential low-rise and mid-rise buildings up to and including 5 storeys.

WithIn the discipline of Civil Engineering; in the field of materials testing and inspection – geotechnical:

- **Evaluating and reporting on** soils for use in building dykes, dams and roads in mining industries.

Within the discipline of Civil Engineering; in the field of materials testing and inspection:

-**Reporting on and directing the technical inspection of,** deep cast-in-place pile foundations, continuous flight auger foundations, steel driven pile foundations and construction materials (aggregate, Portland cement concrete and asphalt cement pavement).

CIVIL ENGINEERING CONT'D

Within the discipline of Civil Engineering; in the field of materials testing and inspection:

- Directing the technical inspection of** asphalt concrete and asphalt binders
- Designing** asphalt concrete mixtures.
- Evaluating** pavement structures
- Preparing plans and specifications for** asphalt concrete roads and parking lot rehabilitation
- Evaluating** asphalt job mix formulas for compliance with project specifications
- **Directing the technical inspection of** construction materials (earthworks, aggregates, portland cement concrete and asphalt concrete pavements)
- Reporting on** construction materials (earthworks, aggregates, portland cement concrete and asphalt concrete pavements)
- Advising on** asphalt concrete, pavement structures and pavement failures
- Directing the construction of** asphalt concrete pavements.

Within the discipline of Civil Engineering; in the field of roadway design, transportation, and materials testing and inspection:

- Evaluating** buildings for bearing review /pile inspection, evaluating materials for the purpose of roadway design (concrete, soils, asphalt)
- Designing** road structures for new roadway construction, roadway rehabilitation/road upgrades and for airport runways pavement structures
- Designing** geotechnical investigations of reservoirs, buildings, pipelines, municipal subdivisions and skateparks
- Advising on** the suitability of septic fields for residential and commercial subdivisions and commercial building sites

Within the discipline of Civil Engineering; in the field of materials testing and inspection:

Advising on, reporting on, directing the technical inspection of: construction materials (earthworks, aggregates, Portland cement concrete and asphalt cement pavements).

Within the discipline of Civil Engineering; in the field of land development:

- **Designing and evaluating:** roadways, gravity sanitary sewer and gravity storm sewer collection systems, storm water management systems, water distribution systems, earthworks and grading, and erosion and sediment control measures.

Within the discipline of Civil Engineering; in the field of infrastructure land development:

- **Reporting on, advising on, designing, evaluating, preparing plans and specifications for, and directing the technical inspection of:** roadways, gravity and low pressure sanitary sewer systems, stormwater management and gravity storm sewer systems, water transmission and distribution systems, site grading, earthworks, and associated erosion and sedimentation control.

The scope excludes: highways and arterial roadways, water treatment systems, and sewage treatment systems.

CIVIL ENGINEERING CONT'D

Within the discipline of Civil Engineering; in the field of roadway design for watercourse crossings:

- **Evaluating, designing, preparing plans and specifications for, directing the construction of, and directing the maintenance of:** standard bridges, culverts, open channels, and associated roadways.

Within the discipline of Civil Engineering; in the field of oil and gas pipeline systems and associated industrial infrastructure:

-**Designing, preparing plans and specifications for, evaluating, and advising on:** oil and gas pipeline systems and associated earthworks, industrial roadways and surface water management systems.

The scope excludes: pressure and thermal stress analysis, high temperature pipeline systems, horizontal directional drill (HDD) systems, retaining walls, pile supports, structural supports, and municipal infrastructure.

Within the discipline of Civil Engineering; in the field of building envelope systems:

- **Designing, evaluating, advising on, reporting on, preparing plans and specifications for, directing the construction of, directing the technical inspection of:** building envelope systems for new and existing high rise and low rise residential and commercial buildings, mixed use buildings, institutional buildings, light industrial buildings and municipal buildings.

Within the discipline of Civil Engineering; in the field of land development:

- **Designing, advising on, reporting on, preparing plans and specifications for:** site grading, gravity sanitary sewer systems, gravity storm sewer systems and watermain distribution systems used in commercial, industrial and residential areas.

Within the discipline of Civil Engineering; in the field of municipal infrastructure:

- **Directing the construction of, directing the maintenance of, directing the technical inspection of, advising on, reporting on and evaluating:** erosion and sediment control measures, earthworks, deep utilities, shallow utilities, concrete and asphalt structures related to land development.

Within the discipline of Civil Engineering; in the field of industrial and municipal landfills:

- **Designing:** earthworks for site grading, storm water collection and drainage systems, lined storage facilities and cover systems.

- **Evaluating, reporting on, directing the technical inspection of:** lined storage facilities, storm water collection and drainage systems, earthworks grading and cover systems.

The scope excludes: Geotechnical Testing and Geotechnical Engineering.

CIVIL ENGINEERING CONT'D

Within the discipline of Civil Engineering; in the field of oil sands operations:

- **Designing, evaluating, reporting on, preparing plans and specifications for and directing the construction of:** surface water management systems used in surface water management approaches to collect, divert and treat water in mining sites.

The scope excludes: Structural design of bridges or bridge culverts

Within the discipline of Civil Engineering; in the field of roadway design and transportation:

- **Designing** conceptual arterial roadways;
- **Evaluating** preliminary drawings of arterial roadways.

Within the discipline of Civil Engineering; in the field of roadway design and transportation:

-**Designing, preparing plans and specifications for, and directing the technical inspection of:** geometrics, intersection improvements, corridor improvements, grade widening, cross-sections, signage, pavement markings, and surface drainage for new construction and rehabilitation of highways, rural and urban roadways, and parking lots.

The scope excludes: Traffic studies, signalization, utilities, and stormwater management facilities.

Within the discipline of Civil Engineering; in the field of roadway and highway design for water crossing:

Directing the technical inspection of, directing the construction of, directing the maintenance of, evaluating, reporting on, and advising on: standard bridges (as defined under Government of Alberta design standards), culverts, and associated retaining walls and roadways.

The scope excludes: major bridge structures.

Within the discipline of Civil Engineering; in the field of materials testing and inspection:

Advising on, reporting on, and directing the technical inspection of: shallow foundations, deep cast-in-place pile foundations, aggregate, Portland cement concrete, and asphalt cement pavement.

Within the discipline of Civil Engineering; in the field of municipal infrastructure:

Designing, and preparing plans and specifications for: sanitary and stormwater collection mains and lot services, water distribution mains and lot services, local to major roadway alignment and grades, and associated earthworks.

The scope excludes: Signalization, pavement marking or signage, intersection design, road capacity or traffic impact assessments, pavement structures, utility pumping or treatment systems, or stormwater management ponds or systems.

CIVIL ENGINEERING CONT'D

Within the discipline of Civil Engineering; in the field of roads and bridges:

- **Preparing plans and specifications for, directing the construction of, advising on, reporting on, directing the technical inspection of, evaluating, and directing the maintenance of:** pedestrian and vehicular bridges, grade separations, corrugated steel and concrete arch culverts, and Mechanically Stabilized Earth (MSE) walls

Within the discipline of Civil Engineering; in the field of municipal infrastructure:

- **Reporting on, advising on, designing, evaluating, preparing plans and specifications for, directing the construction of, and directing the technical inspection of:** municipal water distribution mains, wastewater and storm water gravity mains, and associated service lines; municipal roadway alignments; and associated site grading.

Within the discipline of Civil Engineering; in the field of land development:

- **Reporting on, advising on, evaluating, designing, preparing plans and specifications for, and directing the technical inspection of:** roadway geometry, gravity sanitary sewer mains and services, gravity storm water mains and services, water distribution mains and services, site grading and drainage, within residential, commercial and industrial subdivisions.

The scope excludes: stormwater management ponds or systems, and pumps or pumping systems

Within the discipline of Civil Engineering; in the field of municipal infrastructure:

- **Designing, advising on, and preparing plans and specifications for:** sanitary and stormwater collection systems, water distribution systems, roadways, overland drainage, stormwater management facilities, lot grading and servicing, site grading, and erosion and sediment control programs, all directly within and associated with land development projects.

The scope excludes: pavement structure, traffic volume estimates and traffic assessments, and sewer or water pumping systems.

Within the discipline of Civil Engineering; in the field of municipal infrastructure:

-**Designing, preparing plans and specifications for, and directing the technical inspection of:** sanitary and stormwater collection systems, water distribution systems, roadway geometrics, overland drainage, stormwater management facilities, and lot grading and site grading.

The scope excludes: storm system, sanitary system or water system modelling; pumping systems; treatment systems; roadway structures; traffic volumes assessments; and streetlight design.

CIVIL ENGINEERING CONT'D

Within the discipline of Civil Engineering; in the field of power distribution and lighting:

- Advising on, designing, preparing plans and specifications for, and directing the construction of: civil and structural facets of overhead and underground electrical utility distribution systems up to and including 25 kV, traffic and street lighting.

The scope excludes the practice of electrical engineering.

Within the discipline of Civil Engineering; in the field of roadways and grading:

Reporting on, advising on, designing, preparing plans and specifications for, and directing the technical inspection of: urban and rural roadway geometrics and associated grading and earthworks, industrial site grading and associated earthworks.

The scope excludes: bridges and structural work, roadway structure, roadway capacity assessment, signalization, and stormwater management.

Within the discipline of Civil Engineering; in the field of roadway design:

Designing and preparing plans and specifications for: horizontal and vertical alignments for highways and rural roadways, including associated unsignalized at-grade intersections.

Within the discipline of Civil Engineering; in the field of land development:

-Designing, preparing plans for, and directing the technical inspection of: sanitary sewers, watermains, storm water sewers, site grading, and the alignment of urban and rural roadways directly associated with, and contained within, residential, commercial, and industrial subdivisions.

The scope excludes: - pavement structure, intersection design, traffic volume or capacity assessments, or signalization;- stormwater management, including structures or facilities; and- material selection for utility or road systems

Within the discipline of Civil Engineering, in the field of municipal infrastructure:

- Reporting on, designing, evaluating, preparing plans and specifications for, and directing the technical inspection of: stormwater systems and associated grading and earthworks, and roadway alignments.

The scope excludes: Stormwater management facilities, sewage collection and water distribution systems, roadway structure and traffic capacity assessment.

Within the discipline of Civil Engineering; in the field of municipal infrastructure:

- Designing, and preparing plans and specifications for: the geometrics for local, collector and arterial roadways; storm and sanitary collection mains; water distribution mains; parking lots; and associated grading and earthworks.

CIVIL ENGINEERING CONT'D

Within the discipline of Civil Engineering; in the field of municipal infrastructure:

Designing, preparing the plans and specifications for: storm water gravity collection systems; stormwater management systems; wastewater gravity collection systems; water distribution systems; surface grading and earthworks; and local, collector and arterial road geometrics.

The scope excludes: Pumps, forcemains or treatments systems; signalization; traffic volume estimates and assessments; intersection designs

Within the discipline of Civil Engineering; in the field of municipal infrastructure and roadways:

- **Reporting on, and designing:** stormwater management systems, sanitary sewer systems, and water distribution systems.

- **Preparing plans and specifications for, directing the construction of, and directing the technical inspection of:** stormwater management systems, sanitary sewer systems, sewer lift stations, water distribution systems, local to major roadways, and associated grading and earthworks.

The scope excludes: Sanitary, water or storm water treatment systems, and pumps.

Within the discipline of Civil Engineering; in the field of building systems:

- **Evaluating, designing, preparing plans and specifications for, advising on, directing the construction of, reporting on, and directing the technical inspection of:** building envelope systems and roofing systems for low to high rise residential, commercial, mixed-use, institutional, and light industrial buildings.

Within the discipline of Civil Engineering; in the field of municipal infrastructure:

-**Designing, preparing plans and specifications for, directing the construction of** local, collector and arterial roadways, gravity sanitary sewers, storm water collection systems and water distribution systems.

Within the discipline of Civil Engineering; in the field of municipal infrastructure:

Designing, evaluating, advising on, reporting on, preparing plans and specifications for, and directing the technical inspection of: storm water collection systems, drainage systems, stormwater management systems, and site grading.

CIVIL ENGINEERING CONT'D

Within the discipline of Civil Engineering; in the field of transportation and municipal infrastructure:

Reporting on, advising on, designing, evaluating, preparing plans and specifications for, directing the construction of, and directing the technical inspection of: standard earthworks, water distribution systems, sanitary sewer collection systems, storm water drainage systems, and urban and rural roadways directly related to subdivision development or routine rehabilitation of existing infrastructure.

The scope excludes: traffic impact assessments, roadway structure, intersection capacity design, signalization, transmission mains, and treatment systems.

Within the discipline of Civil Engineering; in the field of power distribution and lighting:

- Designing, evaluating, preparing plans and specifications for, directing the construction of, and advising on: the civil and structural facets of overhead and underground electrical utility distribution systems up to and including 25 kV.

The scope excludes: the practice of electrical engineering.

Within the discipline of Civil Engineering; in the field of municipal infrastructure:

Designing, preparing plans and specifications for: roadway geometrics, gravity sanitary collection systems, gravity storm water collection systems, water distribution systems, and associated site grading and earthworks.

The scope excludes: pumps or pump systems, stormwater management, treatment systems, intersections, signalization, pavement structures, traffic volume assessments.

Within the discipline of Civil Engineering; in the field of the electrical utility industry:

-Designing overhead and underground electric distribution systems up to 25 kV.

The scope excludes: design of electrical protection, control and supervisory control and data acquisition (SCADA) systems.

Within the discipline of Civil Engineering; in the field of municipal infrastructure and construction:

- Advising on, designing, evaluating, preparing plans and specifications for, and directing the technical inspection of: single and multi-family residential, commercial and industrial wood and steel structures, and associated concrete foundations, with all buildings and structures under 2500 square meters in total area and four stories or less in height.

-Advising on, designing, preparing plans and specifications for, and directing the technical inspection of: utility lay-out, site grading, stormwater collection, and stormwater detention, for site areas up to and including 10 ha in total area.

The scope excludes: roadways and pavement, retention ponds, and wetlands.

CIVIL ENGINEERING CONT'D

Within the discipline of Civil Engineering; in the field of municipal infrastructure:

-Designing and preparing plans and specifications for storm water management, storm and sanitary sewer collection systems, water distribution systems, erosion, and sediment control systems.

Within the discipline of Civil Engineering; in the field of airport land development:

-Designing, preparing plans and specifications and directing the technical inspection of runways, aprons, taxiways, airport roadways, storm and sanitary drainage systems and airport land parcel developments

ELECTRICAL ENGINEERING

Within the discipline of Electrical Engineering; in the field of oil and gas operations:

-Designing, preparing plans and specifications for and advising on electrical power distribution systems up to 25 kV, electrical heat tracing systems and industrial lighting systems.

Exclusions: Front end design of systems, high voltage protection systems and SCADA systems.

Within the discipline of Electrical Engineering; in the field of transmission and distribution:

- Preparing plans and specifications for, directing the construction of, evaluating, directing the technical inspection of, directing the maintenance of, and directing the operation of: transmission and distribution substations up to 138 kV.

The scope excludes: Supervisory Control And Data Acquisition (SCADA). Civil and mechanical engineering works.

Within the discipline of Electrical Engineering; in the field of overhead and underground power line infrastructure:

Advising on, designing, reporting on, preparing plans and specifications for: overhead and underground distribution systems up to 25 kV, for residential, commercial, and industrial power supply applications.

Within the discipline of Electrical Engineering; in the field of oil and gas operations:

-Designing electrical power and controls systems (up to 24 VDC, up to 600 VAC) for oil and gas facilities.

Within the discipline of Electrical Engineering; in the field of oil and gas operations:

Designing, evaluating, and advising on: electrical power distribution and control systems (up to 7.2kV), and electrical heat tracing systems (up to 600V) for oil and gas facilities.

The scope excludes: Industrial instrumentation, Programmable Logic Controller (PLC) programming.

Within the discipline of Electrical Engineering; in the field of electrical utility transmission and distribution:

Reporting on, advising on, designing, evaluating, preparing plans and specifications for, directing the construction of, directing the technical inspection of, directing the maintenance of, and directing the operation of: electric utility transmission and distribution systems and their controls systems for substations and electrical houses, up to 240 kV.

The scope excludes: communications and network IT systems.

ELECTRICAL ENGINEERING CONT'D

Within the discipline of Electrical Engineering; in the field of overhead and underground power line infrastructure:

- **Preparing plans and specifications for, reporting on, advising on, and designing:** overhead and underground electrical utility distribution systems up to 25 kV;

- **Preparing plans and specifications for, reporting on, and advising on:** meshed networks for underground utility distribution systems up to 600V.

The scope excludes: protection and control, SCADA systems, design of meshed network for underground electrical utility distribution systems, the practice of civil and mechanical engineering.

Within the discipline of Electrical Engineering; in the field of building systems, power distribution and lighting:

Reporting on, advising on, designing, evaluating, preparing plans and specifications for: electrical power systems (up to and including 13.8kV), fire alarm systems (up to 120V), lighting and lighting controls systems (up to and including 347V), and telephone and data and communications systems (up to 48V) for residential, commercial, institutional and industrial developments.

Within the discipline of Electrical Engineering; in the field of oil and gas operations, and building systems:

Designing, evaluating, advising on, directing the construction of, and preparing plans and specifications for: electrical power distribution systems up to 600V, industrial lighting systems, electrical heat tracing systems, telephone and data communication systems, fire alarm systems and lighting control systems.

The scope excludes: arc flash studies.

Within the discipline of Electrical Engineering; in the field of power distribution:

- **Designing, and preparing plans and specifications for:** overhead and underground electrical utility distribution systems up to and including 25kV.

The scope excludes: short circuit, grounding, coordination studies and the practice of civil engineering.

Within the discipline of Electrical Engineering; in the field of electric utility distribution:

-**Designing, evaluating, and preparing plans and specifications for:** overhead electric utility distribution systems (up to 48 kV) and underground electric utility distribution systems (up to 25 kV).

The scope excludes: upstream protective device design, coordination studies and the practice of civil engineering.

ELECTRICAL ENGINEERING CONT'D

Within the discipline of Electrical Engineering; in the field of power distribution systems:

- **Reporting on, advising on, evaluating, designing, and preparing plans and specifications for:** electrical power distribution systems up to and including 72 kV for industrial facilities

Within the discipline of Electrical Engineering; in the field of oil and gas operations:

- Designing, preparing plans and specifications for, and evaluating: electrical power and control systems up to and including 4160V.

Within the discipline of Electrical Engineering; in the field of radio frequency and telecommunications:

- **Advising on, reporting on, designing, evaluating, directing the construction of, directing the technical inspections of, directing the maintenance of, preparing plans and specifications for, and directing the operation of:** radio frequency and telecommunications systems operating in the frequency range of 3MHz to 76 GHz, and associated power supply systems up to 48 VDC and 240 VAC, and associated power distribution systems up to 48 VDC and 240 VAC.

The scope excludes: power supply and distribution systems with a power requirement greater than 50 kW, and radio broadcast systems with a transmitter output power greater than 1 kW.

Within the discipline of Electrical Engineering, in the field of electrical distribution:

Designing, preparing plans and specifications for, advising on, evaluating, and reporting on: electrical distribution systems up to 35kV and street lighting facilities from 120V to 600V.

The scope excludes: design of grounding, protection, control, and Supervisory Control and Data Acquisition (SCADA) systems.

Within the discipline of Electrical Engineering; in the field of building electrical systems:

- **Evaluating, reporting on, designing, preparing plans and specifications for, directing the construction of, and directing the technical inspection of:** power systems (up to and including 600 VAC), solar photovoltaic systems, intrusion and door access systems, fire alarm and building safety systems, communications systems, and lighting and control systems for new and existing commercial and light industrial buildings.

Within the discipline of Electrical Engineering; in the field of low rise commercial, institutional and municipal building systems:

Designing power distribution systems up to 600V, telephone and data communication systems, fire alarm systems, lighting and lighting control systems.

The scope excludes: on-site power generation systems

ELECTRICAL ENGINEERING CONT'D

Within the discipline of Electrical Engineering; in the field of utility substations and converter stations:

Directing the construction of, directing the technical inspection of, directing the maintenance of, directing the operation of, reporting on, advising on, and evaluating: programmable logic controller (PLC) systems, control and protection systems, and apparatus for power transmission up to 500kV AC and +/- 500kV DC systems.

The scope excludes: supervisory control and data acquisition (SCADA) systems, and telecommunication systems.

Within the discipline of Electrical Engineering; in the field of power distribution and transmission:

- **Evaluating, designing, preparing plans and specifications for, and reporting on:** 25 kV distribution systems and 138 kV transmission systems.

Within the discipline of Electrical Engineering; in the field of electrical power distribution for oil and gas facilities:

- **Designing, preparing plans and specifications for, evaluating, reporting on, and advising on:** electrical power systems (up to and including 35 kV), electrical heat tracing (EHT) systems, and industrial lighting systems.

The scope excludes: supervisory control and data acquisition (SCADA) systems.

Within the discipline of Electrical Engineering; in the field of building design:

-**Reporting on, advising on, designing, evaluating, preparing plans and specifications for, and directing the construction of:** electrical power distribution systems up to and including 600V AC, lighting systems, life safety systems, control systems, and communications systems.

Within the discipline of Electrical Engineering; in the field of oil and gas, substation, and distribution systems:

- **Advising on, evaluating, designing, and directing the construction of:** power distribution up to and including 13.8kVAC; control systems for substations up to 500kV AC; and control systems up to 25kVAC in oil and gas wellsites, facilities, and industrial plants.

The scope excludes: programming programmable logic controllers (PLC), supervisory control and data acquisition (SCADA), and remote terminal unit (RTU); producing grounding studies, arc flash, and fugitive emissions reports.

ELECTRICAL ENGINEERING CONT'D

Within the discipline of Electrical Engineering; in the field of power transmission and distribution:

- **Reporting on, advising on, evaluating, designing and preparing plans and specifications for** power distribution systems up to 72 kV for oil and gas and industrial facilities.

The scope excludes: Protection and Supervisory Control and Data Acquisition (SCADA) systems.

Within the discipline of Electrical Engineering; in the field of oil and gas operations:

- **Designing** electrical power, control and electrical heat trace (EHT) systems (up to 1500 VDC and up to 1000 VAC) for oil and gas operations.

Within the discipline of Electrical Engineering; in the field of oil and gas operations:

- **Designing, preparing plans and specifications for, reporting on:** programmable logic controller (PLC) panels and uninterruptable power supply (UPS) systems up to 24 VDC and 120 VAC; and generator packages, transformers and motor control centres (MCCs) up to 4160 VAC; for oil and gas wellsites and facilities.

Within the discipline of Electrical Engineering; in the field of power distribution:

- **Designing, evaluating and preparing plans and specifications for:** overhead and underground electrical utility distribution systems up to and including 25 kV.

The scope excludes: protection, control and Supervisory Control and Data Acquisition (SCADA) systems.

Within the discipline of Electrical Engineering; in the field of building systems:

Designing, preparing plans and specifications for, and evaluating electrical systems up to 25kV for residential, commercial, institutional, and industrial buildings.

Within the discipline of Electrical Engineering; in the field of power distribution and lighting:

- **Designing** underground power distribution systems for residential and commercial developments (up to and including 25 kV)

- **Designing** lighting for municipal roadways, pedestrian walkways, parking lots, decorative feature lighting, and sports field lighting.

Within the discipline of Electrical Engineering; in the field of electric utility distribution:

-**Designing** the life cycle replacements, reconfiguration, relocation and removal of medium voltage electric utility equipment up to 25 kV.

ELECTRICAL ENGINEERING CONT'D

Within the discipline of Electrical Engineering, in the field of Oil and Gas Operations:

-Designing, evaluating, preparing plans and specifications for electrical power distribution up to 1 kv

-Designing industrial lighting systems

The scope excludes: front end design of electrical systems and design of protection and control systems.

Within the discipline of Electrical Engineering, in the field of electrical systems for oil and gas facilities:

-Designing, evaluating, directing the construction of, advising on and preparing plans and specifications for, electrical power and control systems up to 5 kv

-Designing and preparing plans and specifications for industrial lighting systems

-Designing and preparing plans and specifications for electrical heat tracing systems.

The scope excludes: power system and arc flash studies.

Within the discipline of Electrical Engineering; in the field of mining facilities:

Designing and preparing plans and specifications for electrical power systems for industrial plants (up to and including 34.5 kV).

Within the discipline of Electrical Engineering, in the field of oil and gas operations:

Designing, preparing plans and specifications for and evaluating electrical power systems up to and including 4160 V.

The scope excludes:

- Design, installation and commissioning of SCADA systems
- Design, installation and commissioning of fire protection and suppression systems

Within the discipline of Electrical Engineering; in the field of electric utility transmission and distribution:

- Designing, evaluating, preparing plans and specifications for, advising on, directing the construction of, directing the technical inspection of: utility substation equipment (up to and including 138 kV) and associated protection and control, and supervisory control and data acquisition (SCADA) equipment wiring.

The scope excludes: design of protection and control schemes

ELECTRICAL ENGINEERING CONT'D

Within the discipline of Electrical Engineering; in the field of oil and gas operations:

- **Designing** low voltage (up to and including 750 V) electrical power and controls systems for oil and gas well sites and facilities.

Within the discipline of Electrical Engineering; in the field of electrical heat tracing systems:

-**Designing, reporting on, advising on, evaluating, preparing plans and specifications for, and directing the construction of** electrical heat tracing systems, up to 480 VAC, for industrial facilities.

Within the discipline of Electrical Engineering, in the field of overhead and underground electrical distribution systems:

-**Designing, advising on, evaluating and preparing plans and specifications for:** overhead and underground electrical utility distribution systems up to and including 25 kV.

The scope excludes: protection, control and supervisory control and data acquisition (SCADA) systems.

Within the discipline of Electrical Engineering; in the field of oil and gas operations:

-**Preparing plans and specifications for, advising on, evaluating, reporting on, and designing:** electrical power systems (up to 5 kV), control systems (up to 5 kV), hazardous classification area plans and fugitive emission classification plans for oil and gas facilities.

The scope excludes underground pipelines.

Within the discipline of Electrical Engineering; in the field of electrical power supply:

- **Designing, and preparing plans and specifications for:** electrical power systems up to and including 600VAC for manufacturing and oil and gas operations.

The scope excludes: fire and life safety systems, Safety Instrumented Systems (SIS), process control systems, instrumentation systems, and automation systems.

The scope excludes: Fugitive Emission Studies (FES), and arc flash studies.

Within the discipline of Electrical Engineering; in the field of utility substations:

- **Directing the technical inspection of, directing the operation of, directing the construction of, directing the maintenance of:** protection systems, Programmable Logic Controller (PLC) systems and Supervisory Control and Data Acquisition (SCADA) systems and apparatus for power transmission up to 500 kV AC and +/- 500 kV DC.

The scope excludes: telecommunication systems.

ELECTRICAL ENGINEERING CONT'D

Within the discipline of Electrical Engineering; in the field of electric utility:

- **Designing, preparing plans and specifications for** overhead and underground electrical utility distribution systems (up to and including 25 kV) for residential, commercial and industrial facilities.

The scope excludes: protection, control and Supervisory Control and Data Acquisition (SCADA) systems.

Within the discipline of Electrical Engineering; in the field of building systems:

-**Designing, evaluating, preparing plans and specifications for:** fire alarm systems, VESDA (Very Early Warning Smoke Detection) systems, evacuation systems, and asset protection systems in: industrial, commercial and residential settings.

Within the discipline of Electrical Engineering, in the field of underground and overhead power line infrastructure:

Designing, reporting, advising on and preparing plans and specifications for: overhead transmission systems up to 72 kV and underground transmission systems up to 25 kV, for residential, commercial and industrial power supply applications.

The scope excludes: Network protection, control and supervisory control and data acquisition (SCADA) systems.

Within the discipline of Electrical Engineering; in the field of oil and gas operations:

Designing, evaluating and preparing plans and specifications for: electrical power distribution systems up to 480 V.

The scope excludes: Protection, control and Supervisory Control and Data Acquisition (SCADA) systems.

Within the discipline of Electrical Engineering; in the field of power distribution:

-**Designing, preparing plans and specifications for:** the electrical, civil and structural aspects of overhead and underground electrical utility distribution systems up to 25kV.

The scope excludes: Grounding, lightning protection, network protection and control and SCADA systems.

Within the discipline of Electrical Engineering; in the field of construction planning:

- **Preparing plans and specifications for, evaluating, and reporting on:** construction and maintenance of transmissions lines and substation components which cover electrical voltages up to 500kV.

ENVIRONMENTAL ENGINEERING

Within the discipline of Environmental Engineering; in the field of water resources:

Evaluating, reporting and advising on: programs for the exploration, development and management of water resources and programs for the installation, performance and reclamation of water wells.

Within the discipline of Environmental Engineering; in the field of environmental site assessment:

-Advising on, directing the construction of, evaluating, designing, and reporting on: phase I, phase II, and phase III environmental site assessments (ESAs) and associated remedial programs; risk management plans and programs; soil management plans and programs; and construction environmental management plans and programs.

Within the discipline of Environmental Engineering; in the field of environmental site assessment:

- Preparing plans and specifications for, and directing the construction of phase II environment site assessments

- Reporting on phase II environmental site assessment and remediation activities

INSTRUMENTATION

Within the discipline of Electrical Engineering; in the field of Instrumentation:

-Designing, evaluating, preparing plans and specifications for and advising on: field instrumentation and control valves for Steam Assisted Gravity Drain (SAGD) and conventional oil and gas facilities.

Within the discipline of Electrical Engineering; in the field of instrumentation:

- Evaluating, designing, preparing plans and specifications for, directing the technical inspection of: field instrumentation and safety instrumented systems (SIS) up to and including 120 VAC.

Within the discipline of Electrical Engineering; in the field of instrumentation:

-Directing the operation of, and directing the maintenance of: instrumentation systems, Supervisory Control and Data Acquisition (SCADA) systems and Distributed Control System (DCS) computing systems, and oil and gas measurement systems.

-Designing: oil and gas quality monitoring systems, sample systems, and custody transfer measurement systems.

Within the discipline of Electrical Engineering; in the field of instrumentation:

- Designing and advising on Programmable Logic Controllers (PLC) and Distributed Control Systems (DCS) for the oil and gas industry, and the water and wastewater industry.

Within the discipline of Electrical Engineering; in the field of instrumentation and controls:

Designing, evaluating, directing the technical inspection of, directing the construction of, and directing the operation of: field instrumentation, industrial data communications, human machine interfaces (HMI), distributed control systems (DCS), safety instrumented systems (SIS), fire gas and smoke protection systems (FGS), Programmable Logic Controller (PLC) systems and supervisory control and data acquisition (SCADA) systems; for the oil and gas, petrochemical, mining and utility industries.

The scope excludes: Equipment directly using voltages above 600V.

Within the discipline of Electrical Engineering; in the field of instrumentation and controls for oil and gas operations:

- Advising on, designing, evaluating, directing the construction of, preparing plans and specifications for: industrial instrumentation systems, distributed control systems (DCS), programmable logic controllers (PLC), remote terminal units (RTU), and supervisory control and data acquisition (SCADA) systems.

INSTRUMENTATION CONT'D

Within the discipline of Electrical Engineering; in the field of instrumentation and controls:

-Designing, evaluating, preparing plans and specifications for, directing the maintenance of, directing the operation of: industrial data communications, supervisory control and data acquisition (SCADA) systems, and Programmable Logic Controller (PLC) systems; for the oil and gas and utility industries.

-The scope excludes: power distribution equipment, including power supply to motor control equipment.

Within the discipline of Electrical Engineering; in the field of instrumentation and controls:

Reporting on, designing, evaluating, advising on, directing the technical inspection of, preparing plans and specifications for, directing the construction of, directing the maintenance of, directing the operation of: distributed control systems (DCS), programmable logic controllers (PLC), human machine interfaces (HMI), supervisory control and data acquisition (SCADA), fire gas and smoke protection (FGS), relay logic circuits, and industrial data communication systems, up to 120 VAC for the oil and gas, water, power generation, lumber, and food production industries.

The scope excludes: voltages above 120 VAC.

Within the discipline of Electrical Engineering, in the field of instrumentation and controls:

Designing, evaluating, preparing plans and specifications for: fire, gas, and smoke protection systems (FGS); safety instrumented systems (SIS); basic process control systems (BPCS); human machine interfaces (HMI); and programmable logic controller (PLC) systems, up to 48VDC and 120VAC, for chemical, petroleum, and oil and gas facilities.

Within the discipline of Electrical Engineering; in the field of instrumentation:

- **Designing, evaluating, preparing plans and specifications for, and advising on:** preventative maintenance schedules and equipment reliability strategies for instrumentation and valves in Safety Instrumented Systems (SIS).

- **Designing, evaluating, preparing plans and specifications for:** instrumentation systems for control valves, flow meters, transmitters, and pressure safety valves.

Within the discipline of Electrical Engineering; in the field of automation:

- **Reporting on, advising on, directing the operation of, directing the technical inspection of, evaluating, designing, and directing the construction of:** safety instrumented systems (SIS), distributed control systems (DCS), fire gas and smoke systems (FGS), and programmable logic controller (PLC) systems up to and including 240VAC/48VDC used for industrial processes within the petroleum, chemical, and oil and gas industries.

INSTRUMENTATION CONT'D

Within the discipline of Electrical Engineering; in the field of instrumentation:

- **Preparing plans and specifications for, and evaluating:** field instrumentation for oil and gas facilities.

Within the discipline of Electrical Engineering; in the field of instrumentation and controls:

Designing, evaluating, and preparing plans and specifications for: motor control centres (up to 600V), control panels, programmable logic controllers (PLC), distributed control systems (DCS), safety instrumented system (SIS) control and shutdown systems in the oil and gas industry.

Within the discipline of Electrical Engineering; in the field of instrumentation and controls:

-**Advising on, directing the construction of, evaluating, directing the technical inspection of, and preparing plans and specifications for:** field instrumentation systems

Within the discipline of Electrical Engineering; in the field of instrumentation:

- **Designing, evaluating, directing the maintenance of, and preparing plans and specifications for:** field instrumentation systems for process measurement and control of bitumen upgrading processes in the oil and gas industry

Within the discipline of Electrical Engineering; in the field of instrumentation and shutdown systems:

-**Advising on, designing, evaluating, preparing plans and specifications for** field instrumentation and Safety Instrumented Systems (SIS) for petrochemical industries.

Within the field of Electrical Engineering; in the field of control systems:

-**Advising on, designing, evaluating, preparing plans and specifications for, directing the technical inspection of, and directing the construction of:** human machine interfaces (HMI), safety instrumented systems (SIS), distributed control systems (DCS), fire gas and smoke protection systems (FGS) and programmable logic controller (PLC) systems up to 120VAC, for petroleum, chemical and oil and gas facilities.

Within the discipline of Electrical Engineering; in the field of instrumentation and controls:

Designing, advising on and reporting on distributed control systems (DCS), safety instrumented systems (SIS), programmable logic controllers (PLC), supervisory control and data acquisition (SCADA) systems and field instrumentation for mining and steam assisted gravity drain (SAGD) facilities.

The scope excludes: advanced process control applications.

INSTRUMENTATION CONT'D

Within the discipline of Electrical Engineering; in the field of instrumentation and control:

- **Designing, preparing plans and specifications for, advising on and evaluating:** field instrumentation, fieldbus networking, distributed control systems (DCS), Programmable Logic Controllers (PLC), Safety Instrumented Systems (SIS) Burner Management Systems (BMS), communication networks and low voltage electrical control systems for oil and gas facilities.

Within the discipline of Electrical Engineering; in the field of instrumentation:

Designing and reporting on: Gas detection and associated control systems for oil and gas facilities; and Programmable Logic Controllers (PLC) for the cement loading stations.

Within the discipline of Electrical Engineering; in the field of instrumentation:

Advising on, designing, reporting on, preparing plans and specifications for, and directing the construction of: field instrumentation for oil and gas production and processing facilities, upgraders, refineries, SAGDs and chemical plants.

Within the discipline of Electrical Engineering; in the field of automation & control systems:

-**Designing, preparing plans and specifications for, advising on, and evaluating** Programmable Logic Controllers (PLC) related to control strategies and control functions for liquefied petroleum storage and transportation facilities;

-**Reporting on, advising on, and evaluating:** automation and control system architecture and communication networks related to process control systems for oil and gas industries;

- **Evaluating, reporting on, and preparing plans and specifications for:** the automation and control system integration related to process control systems for oil and gas industries.

The scope excludes: Energization of new power transmission and distribution cabling for oil and gas industries, and for liquefied petroleum storage and transportation facilities.

Within the discipline of Electrical Engineering; in the field of automation:

- **Advising on, preparing plans and specifications for, directing the construction of, and directing the technical inspection of:** control systems integration of distributed control systems (DCS), programmable logic controller (PLC) systems, and safety instrumented systems (SIS) for oil and gas facilities.

Within the discipline of Electrical Engineering; in the field of instrumentation:

-**Evaluating, preparing plans and specifications for, designing, directing the construction of, directing the technical inspection of, advising on, reporting on:** protection systems (up to 110 V) for oil and gas facilities.

INSTRUMENTATION CONT'D

Within the discipline of Electrical Engineering; in the field of electronics and communications:

-Designing, advising on, evaluating, preparing plans and specifications for: electronic measuring equipment for operations in oil and gas exploration.

-Designing, advising on, evaluating, preparing plans and specifications for: conveyance systems and industrial automations incorporating distributed control systems (DCS), supervisory control and data acquisition (SCADA) systems, programmable logic controllers (PLC's) and human machine interfaces (HMI's)

The scope excludes: Programming/software development for the above systems.

Within the discipline of Electrical Engineering; in the field of instrumentation and controls:

- Reporting on, directing the construction of, advising on, directing the maintenance of, and evaluating: safety and automation systems (SAS) and SAS networks for co-generation facilities for the oil and gas industry.

The scope excludes: field instrumentation and valves.

In the discipline of Electrical Engineering; in the field of instrumentation:

Advising on, designing, and evaluating instrumentation systems for process measurement and control of bitumen upgrading facilities in the oil and gas industry

Within the discipline of Electrical Engineering; in the field of automation systems:

Designing, evaluating, advising on, reporting on, preparing plans and specifications for: protection and supervisory control and data acquisition (SCADA) systems for equipment in transmission and distribution substations.

Within the discipline of Electrical Engineering; in the field of instrumentation:

- Designing, and preparing plans and specifications for: field instrumentation control narratives, and shutdown keys for oil and gas facilities.

Within the discipline of Electrical Engineering, in the field of instrumentation:

Advising on, evaluating, designing and directing the maintenance of: measurement transmitters, control valves and isolation valves in petrochemical facilities.

Within the discipline of Petroleum Engineering; in the field of instrumentation and measurement systems:

- Designing, evaluating, preparing plans and specifications for, advising and reporting on, and directing the maintenance, operation, and technical inspection of: fluid flow measurement systems for oil and gas facilities.

MATERIALS ENGINEERING

Within the discipline of Materials Engineering:

Reporting on, designing, preparing plans and specifications for, directing the construction of; cathodic protection and corrosion control systems for conductive electrolyte exposed metallic infrastructure and underground process and utility piping.

Within the discipline of Materials Engineering; in the discipline of materials testing and inspection:

Directing the technical inspection of new and in-service pressure piping, pressure pipelines and pressure equipment utilized in oil and gas and petrochemical industries.

Within the discipline of Materials Engineering; in the field of oil and gas operations:

Preparing plans and specifications for in-service pressure equipment integrity management.

Within the discipline of Materials Engineering; in the field of gas transmission pipelines:

-Designing in-line inspection processes and programs for high pressure (700 kPa to 10,000 kPa) steel gas pipelines.

MECHANICAL ENGINEERING

Within the discipline of Mechanical Engineering; in the field of oil and gas operations:

- **Designing and preparing plans and specifications for** tailings pipelines (slurry, non-segregated tailings, naptha recovery unit, and water) from -45 °C to 98 °C for oil and gas operations
- **Designing** process piping, temperatures from -45 °C to 450 °C and pressures to 4000 kPa(g) for oil and gas operations
- **Designing and preparing plans and specification for** hot water piping up to 22000 kPa(g) pressure

Within the discipline of Mechanical Engineering, in the field of Building Systems:

Designing, preparing plans and specifications for HVAC (heating, ventilation and air conditioning) systems, plumbing systems, and fire protection systems for commercial, institutional, industrial and residential buildings.

Within the discipline of Mechanical Engineering; in the field of building systems:

- **Evaluating, reporting, designing, preparing plans and specifications for and directing the construction of:** HVAC (heating, ventilation and air-conditioning) systems, fire protection systems, and plumbing systems for low, medium and high-rise within residential, commercial, multi-use and healthcare buildings (exclude class A facilities as defined by Canadian Standard Association).

Within the discipline of Mechanical Engineering; in the field of equipment manufacturing:

- **Evaluating, designing and directing the construction of** HVAC equipment from 5,000 to 100,000 CFM, operating under internal static pressure of 1.5" to 6" in water.
- **Designing and directing the construction of** modular data center equipment from 500 kW to 3 MW.
- The scope excludes evaluating, designing and directing the construction of hydronic heating.

Within the discipline of Mechanical Engineering; in the field of packaged fire water pump and air compressor systems:

- **Designing** pump and compressor systems
- **Directing the technical inspection of** pump and compressor systems
- **Evaluating** pump and compressor systems.

MECHANICAL ENGINEERING CONT'D

Within the discipline of Mechanical Engineering, in the field of power generation and distribution:

-Designing, preparing plans and specifications for HVAC (heating, ventilation and air conditioning) systems for industrial buildings

-Designing, preparing plans and specifications for propane, natural gas and diesel fuel systems for gensets and heaters

-Preparing plans and specifications for prime, continuous and standby rated generating plants

-Directing the maintenance and the technical inspection of glycol cooling and HVAC (heating, ventilation and air conditioning) systems for power generating plants, synchronous condensers, 500 kV HVDC stations, and static VAR compensators.

Within the discipline of Mechanical Engineering; in the field of oil & gas operations:

Evaluating and directing the technical inspection of pressure equipment management systems in petroleum processing facilities and pipeline systems relating to fitness for service evaluations, corrosion mitigation, materials specifications and maintenance programs.

Within the discipline of Mechanical Engineering; in the field of process flow control and instrumentation devices:

- Advising on, evaluating, designing, preparing plans and specifications for: pressure measurement devices, level measurement devices, flow measurement devices, control valves, on/off Emergency Shut Down Valves (ESDV) and instrument air compressors used in the oil and gas industry.

Within the discipline of Mechanical Engineering; in the field of oil and gas operations:

- Evaluating and designing pressure retaining components of unfired ASME Section VIII-1 pressure vessels with maximum allowable internal working pressures from vacuum up to and including 3000 psig, at temperatures from -50F to 750F, constructed from the following P No. material groups: P1, P4, P5, and P8.

The scope excludes: vessel supports, external attachments, and vessels that undergo cyclic loading or have external loads

Within the discipline of Mechanical Engineering; in the field of oil and gas equipment:

-Designing: process piping layout and equipment layout of pump packages for above ground oil and gas process facilities.

-Advising on: fabrication of process piping for above ground oil and gas process facilities.

The scope excludes: underground pipelines and under water pipelines.

MECHANICAL ENGINEERING CONT'D

Within the discipline of Mechanical Engineering; in the field of oil and gas operations:

-Evaluating, reporting on, preparing plans and specifications for, directing the construction of, and directing the technical inspection of: oil and gas equipment systems, and piping systems for safe and fit for purpose conditions during commissioning and first start up.

Within the discipline of Mechanical Engineering; in the field of oil and gas operations:

- Designing, evaluating, preparing plans and specifications for: downhole completion and service tools.

Within the discipline of Mechanical Engineering; in the field of Equipment for oil and gas well operations:

- Designing, advising on, preparing plans and specifications for, directing the construction of, directing the technical inspection of, and directing the operation of: downhole cementing equipment and case accessories for oil and gas wells.

Within the discipline of Mechanical Engineering; in the field of oil and gas piping systems:

Designing, and preparing plans and specifications for ASME B31.3 piping wall thickness, piping system geometry layout and piping support spacing for static loads.

The scope excludes: welding, heat treatment, material selection and piping in Category M fluid services.

Within the discipline of Mechanical Engineering; in the field of equipment manufacturing:

Designing, evaluating, advising on, preparing plans and specifications for, and directing the construction of: skid mounted modular compressor packages (10-6500 HP) and gas processing packages operating from vacuum service to 5364 psig in a temperature range of -50F to 500F.

The scope excludes: Underground piping systems.

Within the discipline of Mechanical Engineering; in the field of building systems:

Designing, evaluating, and preparing plans and specifications for: HVAC (heating, ventilation and air conditioning) systems and plumbing systems for residential, commercial, and low to highrise buildings.

Within the discipline of Mechanical Engineering; in the field of fire protection:

Reporting on, advising on, evaluating, and preparing plans and specifications for: fire protection systems for high-hazard (group F, division 1), medium-hazard (group F, division 2), and low-hazard (group F, division 3) industrial occupancies.

MECHANICAL ENGINEERING CONT'D

Within the discipline of Mechanical Engineering; in the field of welding:

Designing, evaluating, advising on, reporting on, preparing plans and specifications for, and directing the technical inspection of: welding procedure specifications, welding processes, and welding specifications and standards for the fabrication, construction, repair and non-destructive examination of atmospheric and cryogenic store tanks (up to psi pressure and -276F to 300F temp, with capacities from 75K up to 45M gallons), piping systems (up to 2,500 psi pressure and -276F up to 300F temp), pressure vessels (up to 2.5 psi pressure and -51F temp) and structural steel assemblies, for the oil and gas, power generation, mining and minerals industries

Within the discipline of Mechanical Engineering; in the field of oil and gas operations:

Designing cylindrical process piping system wall thickness and selection of standard flange connections, with design conditions less than 875 psig between -20F to 250F (ASME class 400 or less), made of P1 Group 1 carbon steel seamless piping and standard flanges with a tested transition temperature of less than or equal to -20F.

The scope excludes: Pressure piping governed by the AS Safety Codes Act, piping supports, skids, stress analyses, custom flanges not meeting ASME B16.5 requirements, cyclic loading, Finite Element Analysis (FEA) analyses, instrumentation, piping requiring post weld heat treatment, hydrostatic and pneumatic pressure testing.

Within the discipline of Mechanical Engineering; in the field of oil and gas operations:

Designing, evaluating, reporting on, advising on, directing the construction of, and directing the technical inspection of: sand control liners for 3000 psi differential pressure and up to 320 °C, flow control liners for up to 5000 psi pressure differential and 320 °C, and down hole tools for up to 5000 psi and up to 320 °C.

Within the discipline of Mechanical Engineering; in the field of oil and gas operations:

- Designing, evaluating, advising on, reporting on, preparing plans and specifications for, directing the technical inspection of, directing the operation of, direction the maintenance of: downhole tools for drilling and completions of oil and gas wells.

Within the discipline of Mechanical Engineering; in the field of fire protection:

- Advising on, evaluating, preparing plans and specifications for, reporting on, and designing: fire suppression systems for industrial, commercial, and residential facilities.

MECHANICAL ENGINEERING CONT'D

Within the discipline of Mechanical Engineering; in the field of building systems:

- **Designing, evaluating, advising on, reporting on, preparing plans and specifications for, directing the technical inspection of, directing the operation of, directing the construction of:** HVAC (heating, ventilation, and air conditioning) systems, plumbing systems, fire suppression systems and process piping systems for residential, commercial, institutional, assembly, health care and industrial buildings.

The scope excludes:

- Group A1 and A4 assembly occupancies, Group FI high hazard industrial occupancies, emergency care hospital spaces, steam systems over 15 psi pressure rating, seismic restraint system design.

Within the discipline of Mechanical Engineering; in the field of oil and gas operations:

-**Reporting on, advising on, evaluating, and preparing plans and specifications for:** the construction of oil and gas processing and piping systems up to 2500 ANSI pressure rating.

The scope excludes: electrical discipline components, civil and structural discipline components, buildings, cryogenic service, wellhead and downhole equipment and components.

Within the discipline of Mechanical Engineering; in the field of oil and gas operations:

-**Designing and preparing plans and specifications for:** drill stem safety valves, full opening safety valves, hydraulic mechanical actuators, and retrievable drop-in check valves for downhole oil well applications to contain or control fluids in compliance with API 5B, 7-1, 7-2, and 7G to a maximum operating pressure of 15000 psig.

The scope excludes: finite element analysis, above ground pressure equipment outside the scope of the above noted standards, and pressure equipment governed by the Safety Codes Act of Alberta.

Within the discipline of Mechanical Engineering; in the field of oil and gas operations:

-**Designing and preparing plans and specifications for:** drill stem safety valves, full opening safety valves, hydraulic mechanical actuators, and retrievable drop-in check valves for downhole oil well applications to contain or control fluids in compliance with API 5B, 7-1, 7-2, and 7G to a maximum operating pressure of 15000 psig.

Within the discipline of Mechanical Engineering; in the field of oil and gas pipeline systems:

Reporting on, advising on, and evaluating the conversion of existing gas pipelines to liquid pipelines.

PETROLEUM ENGINEERING

Within the discipline of Petroleum Engineering; in the field of oil and gas operations:

- **Evaluating:** oil and gas properties and capital projects for economic viability.
- **Reporting on:** short, medium, and long term production volumes for oil, gas and support wells.
- **Designing:** artificial lift systems and well servicing programs for oil, gas, and support wells.
- **Advising on:** the execution of downhole well interventions, well operation initiatives and facility processes for oil, gas, and support wells.
- **Directing the operation of:** oil and gas wells, multi-well oil batteries and water disposal facilities.

Within the discipline of Petroleum Engineering; in the field of oil and gas operations:

- **Preparing plans and specifications for and directing the operation of** oil and gas well drilling, completions and work overs
- **Directing the technical inspection of** materials and equipment used for oil and gas well drilling, completion, repairs, maintenance and abandonment

Within the discipline of Petroleum Engineering; in the field of oil and gas operations:

- **Evaluating, reporting on, advising on and preparing plans and specifications for:** oil and gas reservoirs and optimization plans to increase or stabilize production

The scope excludes drilling rig systems

Within the discipline of Petroleum Engineering; in the field of operations of coal bed methane wells:

- Directing the operation of** well interventions, artificial lift and well stimulation
- Designing** artificial lift systems
- Evaluating** well production profiles, facility and gathering system efficiency and optimization
- Reporting on** well and field production forecasts

Within the discipline of Petroleum Engineering; in the field of oil and gas operations:

Designing and preparing plans and specifications for natural gas distribution systems of low pressure that is less than 700 kPa.

Within the discipline of Petroleum Engineering; in the field of well operations:

- **Designing, preparing plans and specifications for, directing the operation of, and evaluating:** oil and gas well drilling, completion, workover and abandonment operations.

PETROLEUM ENGINEERING CONT'D

Within the discipline of Petroleum Engineering; in the field of oil and gas operations:

- **Designing, directing the operation of, and reporting on:** oil and gas well drilling programs, completions, and work over programs.

Within the discipline of Petroleum Engineering; in the field of oil and gas operations:

Designing upstream oil and gas flowlines and well sites

Within the discipline of Petroleum Engineering; in the field of oil and gas operations:

-**Designing, advising on, evaluating and directing the technical inspection of:** Carbon steel above ground piping systems and carbon steel below ground pipelines

-**Designing, advising on and evaluating:** procedures for the control of hazardous energy (process related)

-**Designing, advising on, evaluating and reporting on:** artificial lift systems for oil and gas production operations.

Within the discipline of Petroleum Engineering, in the field of oil and gas operations:

-**Designing, evaluating, directing the operation of, and preparing plans and specifications for:** upstream oil and gas batteries, wellsite facilities, and pipeline gathering systems.

The scope excludes: pressure vessel and compressor design.

Within the discipline of Petroleum Engineering; in the field of well operations:

- **Advising on, designing, directing the operation of:** completions workovers, and stimulations for disposal wells and well abandonments;

- **Evaluating:** disposal well performance, wellbore details for well acquisitions and well abandonments, and risk mitigation for disposal wells;

- **Preparing plans and specifications for:** well abandonments, new well acquisitions and disposal wells.

Within the discipline of Petroleum Engineering; in the field of exploitation and production:

- **Evaluating and reporting on:** primary and secondary oil reserves using decline analysis and volumetrics calculations;

- **Evaluating on, advising on, and reporting on:** oil and gas assets to determine their economic value for development, acquisitions and divestitures.

PETROLEUM ENGINEERING CONT'D

Within the discipline of Petroleum Engineering; in the field of oil and gas operations:

Designing and directing the operation of: programs for drilling, completion, workover and abandonment operations, and well production processes for oil and gas wells.

Within the discipline of Petroleum Engineering; in the field of oil and gas operations:

-Designing, evaluating, preparing plans and specifications for: recompletions and workovers including artificial lift systems for oil and gas wells.

Within the discipline of Petroleum Engineering; in the field of oil and gas operations:

- Advising on, evaluating, preparing plans and specifications for and directing the operation of: oil and gas well drilling and completions.

Within the discipline of Petroleum Engineering; in the field of oil and gas operations:

- Designing, evaluating, directing the operation of, preparing plans and specifications for, directing the construction of: oil and gas well drilling programs, well abandonments and layouts for oil drilling leases.

The scope excludes: Critical sour wells; deep basin exploratory wells.

Within the discipline of Petroleum Engineering; in the field of oil and gas operations:

- Designing and preparing plans and specifications for: drilling programs for oil and gas wells.

- Directing the operation of: oil and gas well drilling.

- Evaluating and reporting on: drilling performance and optimization plans for oil and gas wells.

Within the discipline of Petroleum Engineering; in the field of oil and gas operations:

-Designing: artificial lift systems for oil and gas wells.

-Evaluating: oil and gas reservoirs for hydrocarbon potential.

-Evaluating: oil and gas wells for production optimization and economic viability.

PETROLEUM ENGINEERING CONT'D

Within the discipline of Petroleum Engineering; in the field of oil and gas operations:

- **Reporting on, advising on, evaluating, and preparing plans and specifications for:** oil and gas production operations, workovers, abandonments, suspensions, recompletions, production optimization, artificial lift systems, production facilities, and pipeline systems;
- **Designing and directing the construction of:** oil and gas workovers, abandonments, suspensions, recompletions and artificial lift systems;
- **Directing the operation of, directing the technical inspection of, and directing the maintenance of:** oil and gas production operations, workovers, abandonments, suspensions, recompletions, artificial lift systems, production facilities, and pipeline systems.

The scope excludes: Electrical and instrumentation within oil and gas operations.

Within the discipline of Petroleum Engineering; in the field of well operations:

- **Advising on, designing, directing the operation of:** completions workovers, and stimulations for disposal wells and well abandonments;
- **Evaluating:** disposal well performance, wellbore details for well acquisitions and well abandonments, and risk mitigation for disposal wells;

Within the discipline of Petroleum Engineering; in the field of oil and gas operations:

- **Designing, preparing plans and specifications for, directing the construction of, directing the operation of:** drilling programs for oil and gas wells.
- **Preparing plans and specifications for:** well abandonments, new well acquisitions and disposal wells.

Within the discipline of Petroleum Engineering; in the field of oil and gas operations:

- Evaluating, advising on, reporting on:** inflow/outflow performance, production decline analysis and optimization opportunities for sour gas wells
- Directing the maintenance of** wellhead and related components (master-valves, wing valves and Emergency Shutdown (ESD)) for gas wells.

Within the discipline of Petroleum Engineering; in the field of oil and gas operations:

- **Evaluating** developed and undeveloped hydrocarbon reserves of conventional and non-conventional properties

PETROLEUM ENGINEERING CONT'D

Within the discipline of Petroleum Engineering; in the field of oil and gas operations:

-Reporting on, directing the operation of, designing, and directing the construction of: drilling programs, completions, abandonments, workovers, and well production processes for sweet and sour oil and gas wells, pipelines and batteries.

Within the discipline of Petroleum Engineering; in the field of oil and gas operations:

- Designing and directing the operation of: drilling, completions, workovers, abandonment programs, and well production processes for oil and gas wells.

Within the discipline of Petroleum Engineering; in the field of oil and gas well completions and production:

- Designing, evaluating, advising on, preparing plans and specifications for, directing the operation of and reporting on: stimulation, hydraulic fracturing and sand control techniques for oil and gas wells, excluding design of sand control equipment and oil and gas handling systems;

- Evaluating, advising on and reporting on completions systems and accessories for the optimized production of oil and gas wells.

The scope excludes: design of sand control equipment and design of oil and gas handling systems

Within the discipline of Petroleum Engineering:

Evaluating and advising on the appraisal, development and production of primary recovery schemes, new and existing sweet service oil and gas reservoirs.

Within the discipline of Petroleum Engineering; in the field of oil and gas operations:

-Directing the operation of: oil and gas civil wellsite lease construction, drilling, completions, workover, artificial lift, optimization and abandonment projects for oil and gas wells.

Within the discipline of Petroleum Engineering; in the field of oil and gas operations:

- Evaluating, reporting on, advising on: exploitation of reserves, reservoir characterization and production optimization for conventional and unconventional oil and gas wells

SOFTWARE ENGINEERING

Within the discipline of Software Engineering; in the field of electronic information systems:

- **Preparing plans and specifications for, directing the construction of, designing, and evaluating:** software components in electronic information systems used for the transmission, distribution and storage of unstructured data.