

Table 2: Unified Facilities Guide Specifications (UFGS) Containing Corrosion Prevention and Control (CPC) Related Guidance¹ (Created 9 January 2020 as a resource linked from the CPC Source – Criteria Page (<http://www.wbdg.org/ffc/dod/cpc-source/criteria>))

DOC. NUMBER	TITLE	DESCRIPTION
UFGS 02 85 00	Mold Remediation	<p>Addresses requirements for demolition, cleaning, removal, and disposal of materials contaminated with mold. Delineates certification and qualification requirements for contractor personnel.</p> <p>Keywords: Mold, Remediation, Humidity, Microbial, Rust, Paint, Coated</p>
UFGS 03 31 29	Marine Concrete with Service Life Modeling	<p>Covers requirements for reinforced concrete that is exposed to marine and chloride environments. Delineates extensive American Concrete Institute (ACI) certification, qualification and experience requirements for contractors. Includes corrosion considerations and protections for various materials. Discusses Concrete Durability and Service Life Design details.</p> <p>Keywords: Corrosion, Cathodic, Rust, Coating</p>
UFGS 08 11 13	Steel Doors and Frames	<p>Doors and frames represent a high corrosion impact facility component. This recently updated UFGS incorporates ESC and American Society of Heating, Refrigerating and Air-Conditioning (ASHRAE) humidity evaluation requirements. Rust and corrosion are mentioned as well.</p> <p>Keywords: Coating, Rust, Inhibitive, Primer, Corrosion</p>
UFGS 09 90 00	Paints and Coatings	<p>Addresses requirements for painting of new and existing, interior and exterior substrates. Includes contractor qualification requirements (e.g. SSPC QP-1, QP-2, etc.) and refers to Society for Protective Coatings (SSPC), National Association of Corrosion Engineers</p>

DOC. NUMBER	TITLE	DESCRIPTION
		<p>(NACE) and Master Painter’s Institute (MPI) Standards.</p> <p>Keywords: Coatings, Corrosion, Rust, Deterioration, Mold, Mildew</p>
UFGS 09 96 00	High-Performance Coatings	<p>Discusses special coatings required for harsh indoor locations or operations (any area subjected to chemical and/or abrasive action), & all outdoor installations. Requires compliance with MPI Standards in MPI Approved Products List, Architectural Painting Specification Manual" before any project is started. Requires <i>"Ensure coating application is done by skilled applicators"</i>.</p> <p>Keywords: Degradation, Coatings, Corrosion, Rust, UV</p>
UFGS 09 96 59	High-Build Glaze Coatings	<p>Describes the requirements for epoxy-polyamide, polyurethane, and epoxy polyester high performance, architectural wall coating systems for interior and exterior surfaces.</p> <p>Keywords: Coatings, Corrosion, Rust</p>
UFGS 09 97 02	Painting: Hydraulic Structures	<p>Requirements for the preparation of surfaces and the application of paints for hydraulic structures and appurtenant items are described. This section was originally developed for USACE Civil Works projects. Addresses Contractor qualifications and certifications (e.g. SSPC QP-1, QP-2, QP-3).</p> <p>Keywords: Coatings, Corrosion, Deterioration</p>
UFGS 09 97 10.00 10	Metallic Coatings for Hydraulic Structures	<p>Covers the requirements for preparation of surfaces and application of metallized coatings for hydraulic structures. This section was originally developed for USACE Civil Works projects. Addresses Contractor qualifications and experience (e.g. NACE Basic, Coating Inspector Training & Certification Program, etc.)</p>

DOC. NUMBER	TITLE	DESCRIPTION
		<p>Keywords: Coatings, Corrosion</p>
<p>UFGS 09 97 13.15</p>	<p>Low VOC Polysulfide Interior Coating of Welded Steel Petroleum Fuel Tanks</p>	<p>Requirements for a Low VOC (< 50 grams/liter) two-coat polysulfide modified novolac epoxy — PMNE coating systems for interiors of newly constructed, Navy bulk fuel storage tanks are described. For maintenance coating design, see notes in the UFGS. Addresses Contractor qualifications and experience (e.g. SSPC QP-5, MPCAC-C14, etc.)</p> <p>Keywords: Coatings, Corrosion, Rust, Pitting</p>
<p>UFGS 09 97 13.16</p>	<p>Interior Coating of Welded Steel Water Tanks</p>	<p>Covers the requirements for polyamide epoxy coating system for interior of newly constructed Navy and Air force water tanks, potable and non-potable, where shop applied coatings are not being considered. Addresses Contractor qualifications and experience (e.g. SSPC QP-5, SSPC C-7, etc.).</p> <p>Keywords: Coatings, Corrosion, Rust</p>
<p>UFGS 09 97 13.17</p>	<p>Three Coat Epoxy Interior Coating of Welded Steel Petroleum Fuel Tanks</p>	<p>Three coat epoxy system for interior coating of newly constructed, Air Force bulk fuel storage tanks is described in this UFGS. Addresses Contractor qualifications and experience (e.g. SSPC QP-5, SSPC QP-1 and SSPC QS-1, etc.)</p> <p>Keywords: Coating, Corrosion, Rust, Pitting</p>
<p>UFGS 09 97 13.25</p>	<p>Maintenance, Repair, and Coating of Tall Antenna Towers</p>	<p>Covers the requirements for coating of new, and repairs to existing, steel towers. Addresses Contractor qualifications and experience (e.g. SSPC QP-2, etc.).</p> <p>Keywords: Coating, Corrosion, Rust, Deterioration</p>
<p>UFGS 09 97 13.26</p>	<p>Coating of Steel Waterfront Structures, Zero VOC, (SZC) Splash Zone Coating</p>	<p>Requirements for coating new or existing steel-sheet piling and other steel waterfront structures is the focus of this UFGS. This coating system may also be used for repairing and coating of aged surfaces. Lists qualifications and</p>

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		<p>submissions requirements for contractors (e.g. SSPC QP 5, C 7, MPCAC, etc.).</p> <p>Keywords: Coating, Corrosion, Rust, Deterioration</p>
UFGS 09 97 13.27	Exterior Coating of Steel Structures	<p>Covers the requirements for zinc-rich epoxy/epoxy/polyurethane coating systems for exteriors of new Navy and Air Force steel structures, such as fuel tanks, water tanks, aboveground piping, etc. Also, see extensive notes at the beginning of the UFGS. Contractor qualifications and certifications include SSPC PCS, SSPC QP 5, etc.</p> <p>Keywords: Coating, Corrosion, Rust</p>
UFGS 09 97 13.28	Protection of Buried Steel Piping and Steel Bulkhead Tie Rods	<p>Requirements for exterior protection tape wrapping systems are addressed. The UFGS states that inspection shall be performed by a NACE certified inspector.</p> <p>Keywords: Coating, Corrosion, Rust</p>
UFGS 09 97 13.00 40	Steel Coatings	<p>Covers the requirements for coating systems, materials, surface preparation, and application of protective coatings of carbon steel.</p> <p>Keywords: Coating, Corrosion, Rust, Pit</p>
UFGS 09 97 23.13	Interior Lining for Concrete Storage Tanks (for Petroleum Fuels)	<p>Requirements for lining concrete tanks for storage of petroleum products is addressed in this UFGS.</p> <p>Keywords: Coating</p>
UFGS 12 31 00	Manufactured Metal Casework	<p>Covers corrosion requirements for fabrication, finish, installation, cleaning, and inspection of metal casework and associated hardware.</p> <p>Keywords: Coating, Corrosion</p>
UFGS 13 34 19	Metal Building Systems	<p>Pre-engineered fabricated metal structures design criteria is the focus of this UFGS. Construction criteria is included as well.</p>

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		<p>Warranties are discussed to include evidence of corrosion. Corrosion resistant fasteners are addressed.</p> <p>Keywords: Coating, Corrosion, Rust</p>
<p>UFGS 23 00 00</p>	<p>Air Supply, Distribution, Ventilation, and Exhaust Systems</p>	<p>Covers requirements for air supply, distribution, ventilation, and exhaust portions of Heating, Ventilation and Air-Conditioning (HVAC) systems. Design and material requirements are included for the prevention of corrosion. UFGS 09 96 00 is referenced to ensure that surfaces are protected from corrosion. Includes requirements to use upgraded materials/coatings in humid locations or project locations with ESC C3 thru C5. Includes ASHRAE 90.1 humid location requirements (zones 0A, 1A, 2A, 3A, 3C, 4C, and 5C)</p> <p>Keywords: Coating, Corrosion, Rust, Deterioration, Degradation, Environmental Severity Classifications (ESC), ASHRAE 90.1 climate zones, stainless steel duct, humid locations</p>
<p>UFGS 23 07 00</p>	<p>THERMAL INSULATION FOR MECHANICAL SYSTEMS</p>	<p>This guide specification covers the requirements for field applied thermal insulation on HVAC and plumbing systems located within, on, under, and adjacent to buildings; above and below ground. Includes requirements to use cellular glass to insulate chilled water, refrigerant and condensate drain lines (incl valves, strainers and fittings) and piping exposed to the weather (use aluminum or stainless jacket) in humid locations or project locations with ESC C3 thru C5 and ASHRAE 90.1 humid location requirements (zones 0A, 1A, 2A, 3A, 3C, 4C, and 5C)</p> <p>Keywords: Coating, Corrosion, Rust, Deterioration, Environmental Severity Classifications (ESC), ASHRAE 90.1 climate zones, stainless jacket, aluminum, cellular glass insulation, humid locations</p>

DOC. NUMBER	TITLE	DESCRIPTION
UFGS 23 21 13.00 20	LOW TEMPERATURE WATER (LTW) HEATING SYSTEM	<p>This guide specification covers the requirements for complete low temperature water heating system including hot water piping (supply and return) and terminal units used for heating, but, does not include feedwater treatment equipment or process hot water terminal units. Piping as used in this specification includes pipe, tubes, flanges, bolting, gaskets, valves, relief devices, fittings, and pressure containing parts of other piping components, hangers and supports, and other equipment items necessary to prevent overstressing of the pressure containing parts. In project locations with Environmental Severity Classification (ESC) of C4 or C5 or high humidity areas as identified in ASHRAE 90.1 as climate zones 0A, 1A, 2A, 3A, 3C, 4C and 5C, require hot-dipped galvanized hangers where ferrous metals are used. See UFC 1-200-01 for determination of ESC for project locations.</p> <p>Keywords: Coating, Corrosion, Rust, Environmental Severity Classifications (ESC), ASHRAE 90.1 climate zones, stainless jacket, aluminum, insulation, humid locations, hot-dipped galvanized hangars</p>
UFGS 23 21 13.23 20	[HIGH][MEDIUM] TEMPERATURE WATER SYSTEM WITHIN BUILDINGS	<p>This guide specification covers the requirements for high and medium temperature water piping systems inside of building mechanical rooms, including connections to interior existing piping and system terminal unit. In project locations with Environmental Severity Classification (ESC) of C4 or C5 or high humidity areas as identified in ASHRAE 90.1 as climate zones 0A, 1A, 2A, 3A, 3C, 4C and 5C, require hot-dipped galvanized hangers if ferrous materials are used.</p> <p>Keywords: Coating, Corrosion, Environmental Severity Classifications (ESC), ASHRAE 90.1 climate zones, stainless steel, insulation, humid locations, hot-dipped galvanized hangars</p>

DOC. NUMBER	TITLE	DESCRIPTION
UFGS 23 35 19.00 20	Industrial Ventilation and Exhaust	<p>Provides requirements for blower and exhaust systems for the removal of flammable vapors. This includes paint spraying residue, corrosive fumes, dust, and stock conveying. Design and material requirements are included for the prevention of corrosion.</p> <p>Keywords: Coating, Corrosion, Rust, Mold</p>
UFGS 23 63 00.00 10	Cold Storage Refrigeration System	<p>Covers requirements for refrigeration equipment for cold storage facilities. This document covers coil corrosion protection extensively.</p> <p>Keywords: Coating, Corrosion, Rust</p>
UFGS 23 64 26	CHILLED, CHILLED-HOT, AND CONDENSOR WATER PIPING SYSTEMS	<p>This guide specification covers requirements for chilled water, chilled-hot (dual service) water and condenser water piping systems associated with HVAC systems, and located within, on, or under buildings, or connected to equipment adjacent to buildings. In project locations with Environmental Severity Classification (ESC) of C4 or C5 or high humidity areas as identified in ASHRAE 90.1 as climate zones 0A, 1A, 2A, 3A, 3C, 4C and 5C, require hot-dipped galvanized hangers if ferrous materials are used.</p> <p>Keywords: Coating, Corrosion, Rust, Environmental Severity Classifications (ESC), ASHRAE 90.1 climate zones, stainless steel, aluminum, insulation, humid locations, hot-dipped galvanized hangars</p>
UFGS 23 81 00	DECENTRALIZED UNITARY HVAC EQUIPMENT	<p>This guide specification covers the requirements for room air conditioners, packaged terminal units, heat pumps, and air conditioners of the single package or split system type. Identifies the requirements in ASHRAE 90.1 climate zones. Provides extensive corrosion prevention requirements.</p> <p>Keywords: Coating, Corrosion, Environmental Effects, ASHRAE 90.1 climate zones,</p>

DOC. NUMBER	TITLE	DESCRIPTION
		aluminum, insulation, humid locations, hot-dipped galvanized, copper
UFGS 26 11 14.00 10	Main Electric Supply Station and Substation	<p>Requires that equipment and hardware be coated with corrosion-resistant finishes (see UFGS for specific details). Corrosion Protection includes additional requirements.</p> <p>Keywords: Corrosion, Protection, Coating, Paints, Primer, Resistant, Humidity Control</p>
UFGS 26 12 19.10	THREE-PHASE, LIQUID-FILLED PAD-MOUNTED TRANSFORMERS	<p>This guide specification covers the requirements for three-phase pad-mounted, liquid-filled transformers of the dead-front and live-front types for exterior applications. Under “Corrosion Protection” users are directed to use stainless steel bases and cabinets for most applications. In highly corrosive environments, the additional cost of totally stainless steel tanks and metering enclosures may be justified. Manufacturer's standard construction material is acceptable only in noncoastal and noncorrosive environments. Choose the second bracketed option for project locations with Environmental Severity Classifications (ESC) of C4 and C5.</p> <p>Keywords: Coating, Corrosion, Degradation, Environmental Severity Classifications (ESC), stainless steel tanks and metering enclosures, temperature and humidity</p>
UFGS 26 20 00	INTERIOR DISTRIBUTION SYSTEM	<p>This guide specification covers the requirements for the procurement, installation, and testing of electrical wiring systems for construction projects. Note that the scope of the UFGS is refined describing wiring systems not covered (e.g. Building telecommunications cabling, etc.). For all outdoor applications at project locations with Environmental Severity Classification (ESC) factors of C4 and C5 and all indoor applications in a harsh environment, select NEMA 4X Option.</p> <p>Keywords: Coating, Paint, Corrosion, Deteriorate, Rust, Environmental Severity</p>

DOC. NUMBER	TITLE	DESCRIPTION
		Classifications (ESC), temperature and humidity, Stainless Steel, Brass, Aluminum
UFGS 26 23 00	LOW-VOLTAGE SWITCHGEAR	<p>This guide specification covers the requirements for metal-enclosed low-voltage power circuit-breaker switchgear assemblies in either interior or exterior locations and is intended for alternating current applications. In corrosive and humid environments, use materials, systems, components, and coatings that are durable and minimize the need for preventative and corrective maintenance over the expected service life of the component or system. Corrosive project locations are those with Environmental Severity Classification (ESC) of C3, C4, and C5. Humid locations are those in ASHRAE climate zones 0A, 1A, 2A, 3A, 4C, and 5C (as identified in ASHRAE 90.1). See the “Enclosure” section for additional guidance related to ESC.</p> <p>Keywords: Coating, Paint, Corrosion, Rust, Environmental Severity Classifications (ESC), ASHRAE 90.1 climate zones, stainless steel, galvanized steel, humid locations</p>
UFGS 26 42 13.00 20	Cathodic Protection by Galvanic Anodes	<p>Covers requirements for cathodic protection systems that use galvanic anodes for underground piping and buried or submerged structure. Required to obtain services of Corrosion Engineer with cathodic protection education and experience.</p> <p>Keywords: Coating, Corrosion, Cathodic Protection, Mold</p>
UFGS 26 42 14.00 10	Cathodic Protection System (Sacrificial Anode)	<p>Requirements for cathodic protection systems that use continuous flow direction current from sacrificial anodes are addressed. Obtain services of a corrosion expert to supervise, inspect, and test installation and performance of CP system. Requires NACE certifications.</p> <p>Keywords: Coating, Corrosion, Cathodic Protection, Rust</p>

DOC. NUMBER	TITLE	DESCRIPTION
UFGS 26 42 15.00 10	Cathodic Protection System (Steel Water Tanks)	<p>Covers requirements for cathodic protection systems using impressed current anodes. Obtain services of a corrosion expert to supervise, inspect, and test installation and performance of CP system. Requires NACE certifications.</p> <p>Keywords: Coating, Corrosion, Cathodic Protection</p>
UFGS 26 42 17.00 10	Cathodic Protection System (Impressed Current)	<p>Requirements for cathodic protection systems that use impressed current anodes are delineated. Obtain services of a corrosion expert to supervise, inspect, and test installation and performance of CP system. Requires NACE certifications.</p> <p>Keywords: Coating, Corrosion, Cathodic Protection, Rust</p>
UFGS 26 42 19.10	Cathodic Protection Systems (Impressed Current) for Lock Miter Gates	<p>Provides requirements for lock miter gate cathodic protection systems. Obtain services of a corrosion expert to supervise, inspect, and test installation and performance of CP system. Requires NACE certifications.</p> <p>Keywords: Coating, Corrosion, Cathodic Protection</p>
UFGS 26 56 00	Exterior Lighting	<p>Includes corrosion resistant requirements for housing oil-filled capacitors, aluminum poles, and electrical equipment finishes.</p> <p>Keywords: Corrosion, Resistant, Painting, Coating,</p>
UFGS 26 56 13.00 40	Lighting Poles and Standards	<p>Covers the requirements for lighting poles, standards, and related mounting accessories for exterior lighting, including, but not limited to, area lighting, flood lighting, roadway lighting, and security lighting systems. Require corrosion resistant aluminum alloys finish for poles. Grounding rod material requirements are specified.</p> <p>Keywords: Coating, Corrosion</p>

DOC. NUMBER	TITLE	DESCRIPTION
UFGS 33 11 00	Water Utility Distribution Piping	<p>Addresses the requirements for potable and non-potable systems with an extensive listing of corrosion related requirements.</p> <p>Keywords: Coating, Corrosion, Rust, Degradation, Cathodic Protection</p>
UFGS 33 40 00	Storm Drainage Utilities	<p>Covers the requirements for potable and non-potable (raw water and sea or salt water) systems, in which the largest size pipe is 1200 mm 48 inches in diameter and the maximum working pressure does not exceed 1200 kPa 175 psi for pipelines 300 mm 12 inch size and smaller and 1000 kPa 150 psi for pipelines larger than 300 mm 12 inch size. This section covers exterior water distribution and transmission systems, including water supply, distribution and service lines and connections to a point approximately 1.5 m 5 feet outside of buildings and structures. Corrosion material selection guidelines are provided.</p> <p>Keywords: Coating, Corrosion, Rust</p>
UFGS 33 63 13	Exterior Underground Steam Distribution Systems	<p>Delineates CP requirements and requires coordination with other design disciplines. Services of a corrosion engineer with stated experience is required. Corrosion resistant materials are discussed and required. Discusses corrosion resistance requirements for various materials and components.</p> <p>Keywords: Corrosion, Corrosion Engineer, Cathodic Protection, Coatings, Deterioration, UV Degradation</p>
UFGS 33 71 01	Overhead Transmission and Distribution	<p>Describes corrosion resistant coatings and materials. Requires use of UFGS 09 90 00 Paints and Coatings. Corrosion components discussed included connectors and splices, hardware, transformer tanks and covers, and finishes. In corrosive environments, galvanized steel pole-line hardware may not be acceptable and only hot-dip galvanized malleable or ductile iron should be permitted. Utilize the following</p>

DOC. NUMBER	TITLE	DESCRIPTION
		<p>sentence requiring hot-dip galvanized hardware in corrosive environments defined as those project locations in Environmental Severity Classification (ESC) C3 thru C5.</p> <p>Keywords: Corrosion, Deterioration, Finishes, Coatings, Degradation, Environmental Severity Classifications (ESC), Galvanized Steel Pole, Hot-dip Galvanized</p>
UFGS 33 71 02	UNDERGROUND ELECTRICAL DISTRIBUTION	<p>This guide specification covers the requirements for underground electrical work. For projects with direct-buried cable (not in conduit) and at project locations in Environmental Severity Classifications (ESC) C4 and C5, treat soil a minimum 305 mm 12 inches on each side for the entire length of the cable. For underground feeders supplying buildings - for Navy only, choose PVC. Do not specify IMC/aluminum in corrosive locations.</p> <p>Keywords: Corrosion, Corrosive Locations, Environmental Severity Classifications, Cathodic Protection, Coatings, Paint, Rust, Deterioration</p>
UFGS 33 52 10	Fuel Systems Piping (Service Station)	<p>Provides extensive guidance on CP control systems, flange protectors and pressure relief valve corrosion protection.</p> <p>Keywords: Corrosion, Cathodic Protection, Coating</p>
UFGS 33 52 40	Fuel Systems Piping (Non-Hydrant)	<p>Provides extensive guidance on CP control systems, flange protectors, pipe casings and pressure relief valve corrosion protection similar to UFGS 33 52 10.</p> <p>Keywords: Corrosion, High Corrosion Environments, Cathodic Protection, Coatings, Rust</p>
UFGS 33 56 10	Factory-Fabricated Fuel Storage Tanks	<p>Describes CP, corrosion protection systems, component coating and inspection, installation procedures to resist corrosion impacts.</p>

DOC. NUMBER	TITLE	DESCRIPTION
		<p>Keywords: Rust, Corrosion, Corrosion Control System, Cathodic Protection, Salt Water Environment, Non-corroding</p>
UFGS 40 05 13	Pipelines, Liquid Process Piping	<p>Covers requirements for above and below grade liquid process piping located both inside and outside of treatment plants. Extensive references to corrosion control of components for both above and below ground installations and associated materials.</p> <p>Keywords: Coating, Corrosion, Rust, Degradation, Cathodic Protection, Pitting, Deterioration</p>
UFGS 40 18 00.00 40	Vacuum Systems Process Piping	<p>Covers requirements for aboveground low-vacuum systems defined for the purposes of this section as systems at pressures less than atmospheric and ranging to approximately 100 kilopascal (29.5 inches of mercury), 1.734 kilopascal (0.25144 psi) or 13 millimeter of mercury 29.5 inches of mercury vacuum or the approximately absolute; 0.25144 pound per square inch, absolute, 13,000 microns of mercury absolute, or 13 torr. Extensive references to corrosion control of components and materials.</p> <p>Keywords: Coating, Corrosion</p>
UFGS 01 45 00.00 20	Quality Control ²	<p>Establishes the basic requirements for a Quality Control (QC), Commissioning (Cx), Design program for Design Bid Build QC. It is recommended that CPC requirements should be reflected in the plan and oversight provided. Material storage requirements include protection to prevent corrosion.</p> <p>Keywords: QC Program Requirements, Commissioning Program, Plan Submission Requirements, Design Review & Documentation, Corrosion, Commissioning Corrosion</p>

DOC. NUMBER	TITLE	DESCRIPTION
UFGS 01 45 00.10 20	Quality Control for Minor Construction ²	<p>Covers the requirements for Quality Control for small construction projects and repair or maintenance work. It may also be used for minor elements or small quantities of work in larger projects at the discretion of the Government. It is recommended that CPC requirements should be reflected in the plan and oversight provided.</p> <p>Keywords: QC Organization & Requirements, Testing, Submittals, Acceptance</p>

1. Note that under the Division Heading such as “Openings” there may be additional UFGS that include corrosion related requirements. These requirements may include ESC and ASHRAE humidity considerations. For example, UFGS 08 11 13 Steel Doors and Frames is listed above. UFGS 08 11 16 Aluminum Doors and Frames is not, although it has recently been updated to reflect UFC 1-200-01 ESC requirements. Including every UFGS document makes this listing cumbersome and duplicative of the UFGS master list. Criteria management is a dynamic process and changes occur all of the time; this listing is provided as an awareness and education tool to help the designer develop responsible and life cycle effective component designs. It is not intended to take the place of researching and including the appropriate identification of design requirements.
2. Commissioning, QC and QA programs require that the individual have certain qualifications and certifications. For the QC/QA/Cx person to do their job effectively CPC related certifications and qualifications should be considered.