

Technical Seminar for Cathodic Protection to GOGC Design Unit Specialists

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WITHIN THE JURISDICTION OF THE MINISTRY OF ENVIRONMENT, ENERGY & CLIMATE CHANGE



Source of Development, Supplier of Energy

CEN/TC 219 – Published Standards

WG 1

EN 13509:2003, Cathodic protection measurement techniques
EN 12954:2001, Cathodic protection of buried or immersed metallic structures - General principles and application for pipelines
EN 14505:2005, Cathodic protection of complex structures
EN 15112:2006, External cathodic protection of well casings
EN 13636:2004, Cathodic protection of buried metallic tanks and related piping
CEN/TS 15280:2006, Evaluation of a.c. corrosion likelihood of buried pipelines - Application to cathodically protected pipelines

WG 2

EN ISO 12696:2012, Cathodic protection of steel in concrete
CEN/TS 14038:2004, Electrochemical realkalization and chloride extraction treatments for reinforced concrete – Part 1: Re-alkalization
CEN/TS 14038:2011, Electrochemical realkalization and chloride extraction treatments for reinforced concrete – Part 2: Chloride extraction

WG 3

EN 12473:2000, General principles of cathodic protection in sea water
EN 12474:2001, Cathodic protection of submarine pipelines
EN 12495:2000, Cathodic protection for fixed steel offshore structures
EN 13173:2001, Cathodic protection for steel offshore floating structures
EN ISO 13174:2012, Cathodic protection for harbour installations
EN 16222:2012, cathodic protection of ship hulls

WG 4

EN 12499:2003, Internal cathodic protection of metallic structures

WG 5

EN 15257:2006, Cathodic protection - Competence levels and certification of cathodic protection personnel

WG 6

EN 12068:1998, Cathodic protection - External organic coatings for the corrosion protection of buried or immersed steel pipelines used in conjunction with cathodic protection - Tapes and shrinkable materials



- **CEN EN 12954:2001. *Cathodic Protection of Buried or Immersed Metallic Structures - General Principles and Applications for Pipelines,***
- **CEN EN 13509:2003, *Cathodic protection measurement techniques,***
- **CEN EN 14505:2005. *Cathodic Protection of Complex Structures,***
- **CEN EN 50162:2003, *Protection against corrosion by stray current from DC systems,***

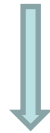


- **CEN EN 12068:1998. Cathodic Protection-External organic coatings for the corrosion protection of buried or immersed steel pipelines used in conjunction with cathodic protection-Tapes and shrinkable materials.**
- **CEN/TS 15280:2006. Technical Specification, Evaluation of a.c. corrosion likelihood of buried pipelines–Application to cathodically protected pipelines.**



Basic standards for CP of pipelines

- **EN 12954 : 2001 (for buried or immersed pipelines)**
- **ISO 15589-1 : 2003 (for on-shore pipelines)**
- **CEN/TS 15280 : 2006 (for ac corrosion of pipelines)**



- **pr ISO 15589-1 (for on-shore pipelines)**
- **prEN 12954-1 (General Principles)**
- **prEN 12954-2 (Pipelines applications)**



DIN standards

- **DIN 50919:1984. Corrosion of metal; investigations of galvanic corrosion in electrolytic solutions**
- **DIN 50925:1992. Verification of the effectiveness of the cathodic protection of buried structures,**
- **DIN 50929 (Parts 1,2,3) : 1985. Probability of corrosion of metallic materials when subject to corrosion from the outside.**
- **DIN EN 10289:2004, Steel tubes and fittings for onshore and offshore pipelines - External liquid applied epoxy and epoxy-modified coatings**
- **DVGW 2007. AfK Recommendation No.3, Measures for the installation and operation of pipelines in the vicinity of three-phase high voltage systems and single-line traction systems**



Standards

- **ISO 8044, Corrosion of metals and alloys — Basic terms and definitions**
- **ISO 13623, Petroleum, petrochemical and natural gas industries — Pipeline transportation systems**
- **ISO 13847, Welding of pipelines**
- **ISO 15589-2, Petroleum, petrochemical and natural gas industries — Cathodic protection of pipeline transportation systems — Part 2: Off-shore pipelines**



Standards

- **ISO 21809-1, *Petroleum and natural gas industries - External coatings for buried or submerged pipelines used in pipeline transportation systems - Part 1 : polyolefin coatings (3-layer PE and 3-layer PP)***
- **ISO 21809-2, *Petroleum and natural gas industries - External coatings for buried and submerged pipelines used in pipeline transportation systems - Part 2 : fusion-bonded epoxy coatings***
- **ISO 21809-3, *Petroleum and natural gas industries - External coatings for buried and submerged pipelines used in pipeline transportation systems - Part 3 : field joint coatings***
- **ISO 21809-5, *Petroleum and natural gas industries - External coatings for buried or submerged pipelines used in pipeline transportation systems - Part 5 : external concrete coatings***



Standards

- **IEC 62305-4, *Protection against lightning – Part 4: Electrical and electronic systems within structures***
- **EN 1594, *Gas supply systems — Pipelines for maximum operating pressure up to 16 bar — Functional requirements***
- **EN ISO 10012, *Measurement management systems - Requirements for measurement processes and measuring equipment***
- **EN 10329, *Steel tubes and fitting for onshore and offshore pipelines - External field joint coatings***
- **EN 12007-1, *Gas supply systems — Pipelines for maximum operating pressure over 16 bar — Functional requirements - Part 1: General***
- **EN 12007-3, *Gas supply systems — Pipelines for maximum operating pressure over 16 bar — Functional requirements – Part 3: Steel pipelines***



Standards

- **EN 12732, *Gas supply systems - Welding steel pipework - Functional requirements***
- **prEN 12496, *Galvanic anodes for cathodic protection in seawater and saline mud***
- **EN 12696, *Cathodic protection of steel in concrete***
- **EN 13509, *Cathodic protection measurement techniques***
- **EN 14161 (ISO 13623: 2000 modified), *Petroleum and natural gas industries – Pipeline transportation systems (ISO 13623:2000 modified)***
- **EN 15257, *Cathodic protection - Competence levels and certification of cathodic protection personnel***



Standards

- ***prEN 15280, Evaluation of a.c. corrosion likelihood of buried pipelines - Application to cathodically protected pipelines***
- ***EN 50162, Protection against corrosion by stray current from direct current systems***
- ***EN 50122-1, Railway applications - Fixed installations - Electrical safety, earthing and the return circuit - Part 1 : protective provisions against electric shock***
- ***EN 50122-2, Railway applications - Fixed installations - Electrical safety, earthing and the return - Part 2 : provisions against the effects of stray currents caused by d.c. traction systems***
- ***EN 50122-3, Railway applications - Fixed installations - Electrical safety, earthing and the return circuit - Part 3 : mutual interaction of a.c. and d.c. traction systems***



Standards

- **EN 50164-3, *Lightening Protection Components (LPC) – Part 3 : Requirements for isolating spark gaps***
- **prEN 50443, *Effects of electromagnetic interference on pipelines caused by high voltage a.c. electric traction systems and/or high voltage a.c. power supply systems***
- **EN 60079-10, *Electrical apparatus for explosive gas atmospheres - Part 10 : classification of hazardous areas***



Literature

- PhD Thesis

**Influence of ac interference on the cathodic protection of buried pipelines
(May 2009) – in greek**

<http://thesis.ekt.gr/thesisBookReader/id/17964#page/1/mode/2up>

- **Baeckmann W. von, Schwenk W., Prinz W. eds., 1997. *Handbook of cathodic corrosion protection, theory and practice of electrochemical protection processes*. Translated from German by Robert Waterhouse et al. Houston TX: Gulf (Originally published in 1989)**
- **Peabody, A.W., 2001. *Peabody's Control of Pipeline Corrosion*, Bianchetti, R.L. ed., 2nd ed., Houston TX : NACE International**
- **Lazzari, L. Pedferri, P., Cathodic Protection, polipress, Milan, 2006**