

*Peter Elliott*



Corrosion and Materials Consultancy, Inc

87 Carriage Hill Drive  
Colts Neck, NJ 07722  
Ph. 732-303-0538  
Fx. 732-303-0591

[peter@pelliotcorrosion.com](mailto:peter@pelliotcorrosion.com)

## **CURRICULUM VITAE**

**Peter Elliott**

BSc MSc PhD CEng FIMMM FNACE

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### **PROFESSIONAL SUMMARY**

- Professional independent engineering services and technical support in metallurgy, corrosion and high-temperature materials performance for all sectors of industry.
- Over 35 years experience in the understanding and application of metallurgy, materials and corrosion control principles and risk minimization associated with materials.
- Design appraisals, advisory work, inspections, site condition surveys, failure analysis investigations, cause and origin assessments, testing and simulation studies, etc., for industry, local authorities, government agencies, insurers, loss adjusters, arbitrators and the legal profession.
- Experience with major plant failures – including process plant, refineries, gas turbines boilers, pipelines and buildings – after explosions, fires, chemical release, flood damages and structural collapse.
- Assessing malfunctioning machinery, component breakdowns, electrical failures, cargo condition surveys, buildings and infrastructure, pipelines, water mains, aerosol cans, supports and guardrails, chairs and stools, poorly fabricated parts and equipment.
- Experienced expert witness in metallurgy, materials selection, failure analysis, design and corrosion-related issues.
- Specialist in planning and presenting seminars and in-house training courses on materials, design and corrosion control for engineers, management, designers, operators, inspectors and risk assessors. Presentations include materials selection and design, corrosion engineering, corrosion in the oil and gas industries, troubleshooting and failure analysis.
- Approximately 100 published technical papers and over 100 professional presentations, including radio and television.

### **EDUCATION**

- BSc, (Hons), Metallurgy, University of Manchester, England – 1962
- MSc, Metallurgy, University of Manchester, England – 1963
- PhD, Metallurgy, University of Manchester, England – 1965

## REGISTRATIONS

- Licensed Chartered Engineer – CEng. (#371093)
- Fellow, Institute of Corrosion – FICorr. (#1141) – through 2008.
- Fellow, Institute of Materials, Minerals & Mining (formerly Metals) – FIMMM. (#87718)
- Corrosion Specialist – NACE International, (#4964)
- NACE Fellow – NACE International (1999).

## WORK EXPERIENCES

Advisory services, including materials for corrosive and demanding high-temperature service in chemical and refining plant, molten salt heat exchangers for solar energy applications, and for dynamic molten salt conditions. Troubleshooting and failure investigations on malfunctioning machinery and equipment, including component breakdowns, structural collapse, fire, heat, chemical and flood damage. Examples include isolated breakdowns in process plant and equipment, commercial buildings, hotels, offices, etc., infrastructure, piping, water mains, storage vessels, above/underground storage tanks, reactors, machinery, aerosol cans, chairs, plumbing, wire ropes, elevators & escalators, automobiles & transportation vehicles, ships & cargoes.

## REPRESENTATIVE PROJECTS

### Chemical/Petrochemical Plant

- Refinery fire, Syncrude, Canada.
- Urea Plant explosion, Lake Charles, Louisiana.
- Oil contamination issues, refinery, San Francisco, California.
- Explosion at Kaiser's alumina plant, New Orleans, Louisiana.
- Gas cooler failures in sulfuric acid plant, South Africa.
- Corrosion under fireproofing in refinery, Texas.
- Materials assessments [Fitness for Service] after refinery fire, Mexico.
- Tubing failures in an ammonia plant; location cannot be disclosed.
- Structural integrity of hot stack after loss of refractory insulation, Illinois.
- Materials recommendations: solar heating systems, USA, Europe & elsewhere.
- Materials recommendations for high-temperature salt baths, UK.
- Sulfur chlorine materials corrosion issues, Louisiana.
- Air Preheater Tube failures; USA, past & current.

### General Engineering

- Ignitor failures in domestic gas furnaces, Minneapolis, Minnesota.
- Chair failures – various, New York, New York; Philadelphia, Pennsylvania.
- Failed screws from prosthetic device, New Jersey.
- Assessing water damage to gyroscopes after flood, New York, New York.
- Escalator step failure, Kennedy Airport, New York.
- Broken guardrail from subway, New York, New York.
- Hydraulic cylinder failures. coal mine, Price, Utah.
- Aerosol can failures (lube oils), Trenton, New Jersey.
- Fracture of paint aerosol cans, USA, Puerto Rico and elsewhere.
- Failure of lightning arrestor, Philadelphia, Pennsylvania.
- Failure of gasoline dispenser pipe, Philadelphia, Pennsylvania.
- Coating failures on generator panels. New York, New York.
- Corrosion in underground oil storage tanks – several cases, New Jersey, New York
- Condition survey of aluminized steel in underground culvert, DFW airport, Texas.
- Long-term underground corrosion of grounding electrodes, Research Association, MA.
- Determining time to corrosion in buried steel drums, New Jersey.
- Failure analysis of artificial leg support, New York.
- Failed guardrails on aircraft service vehicle, Newark, New Jersey.

- Broken hand tools, various cases, New York and New Jersey.

#### **Utilities**

- Failure of large water main. New York, New York.
- Failure of power generator systems, BELCO, Bermuda.
- Gas turbine failures - several, Saudi Arabia; United Arab Emirates.
- Boiler tube explosion, Cadafe, Venezuela.
- Fuel oil corrosion in boiler, Dominican Republic.
- 30-inch oil pipeline rupture, Mexico.
- Fire-related damage from gas supply lines, Chicago, Illinois.
- Condition survey in water treatment plant, USA.
- Premature failure of a new water-treating plant, USA.
- Candidate materials for solar energy applications, Netherlands.

#### **Building & Construction**

- SCC failures in copper tubing – condominiums, Chicago, Illinois.
- Premature failure of sliding doors in condominiums, Bethany Beach, Delaware.
- Determining cause of cracking in acrylic skylights, Long Island, New York.
- Elevator cable failures – several, New York, New York.
- Evaluating structural steelwork in elevator shafts, WTC, New York, New York.
- Corroded galvanized water piping in high-rise buildings, New Jersey.
- Sprinkler system valve failure, New York, New York.
- Loss of coatings on structures in the Orange Bowl, Miami, Florida.
- Leaking copper water pipes in high-rise condominiums, Washington, DC.
- Loss of patina on zinc roofing, San Francisco, California.
- Duct work evaluations after a fire in a luxury mansion, Dallas, Texas.
- Dielectric coupling failure and flood damage in high-rise building, New York, New York.
- Resolving SCC in insulated copper tubing, USA - general, Mexico.
- Influence of wood preservative chemicals on material performance, - general, USA.
- Leaking copper water pipes in luxury apartments, Washington, DC.
- Corroded structural steel supports in commercial premises, New York, New York.

#### **Food & Beverages**

- Stress corrosion cracking in processing of tomato sauce, England, UK.
- Failed soda cans – several locations, USA.
- Cracking in brewery vessel, Canada.
- Failure of sardine cans, San Francisco, California.
- Failure analysis on refrigerated food storage pans, Tennessee.

#### **Transportation**

- Chlorine tank car valve leak, Wilmington, Delaware.
- Disbonding of coatings on Metro cars, Hong Kong.
- Failed acid-carrying road tanker, New Jersey.
- Accident involving moving truck, New Jersey.
- Pipe failure and flooded ship's hold, Savannah, Georgia.
- Galvanized steel cargo damages – several, Chicago & New York.
- Steel cargo damages following voyage, New York, New York.
- Seal failure on ship, New York, New York.
- Failure of leg supports in a jack-up barge, New Jersey.

#### **SPECIAL EXPERTISE**

- Stress corrosion cracking of copper tubing under elastomeric insulation.
- High temperature oxidation and hot corrosion (molten salts, molten glasses, etc.).
- Formicary (ant-nest) corrosion in ACR copper tubing.
- Surveying underground storage tanks.

*(Further information on these and other specific cases may be available on request).*

## POSITIONS HELD

**Corrosion and Materials Consultancy, Inc.** Colts Neck, NJ.  
*President.* 1987- present  
Consulting services – as detailed herein. Incorporated in New Jersey in May 1990.

**Cortest Engineering Services, Inc.**, Houston, TX; Rockville, MD.  
**Cortest Laboratories, Ltd.**, Sheffield, UK.  
*Senior Engineer.* 1986 - 1987  
Materials utilization and testing; contract R & D; site surveys; troubleshooting. Established UK office/laboratory.

**Independent Total Inspection, Inc.**, Houston, TX  
**ITI, Ltd.**, Watford, UK.  
*Director.* 1985 - 1986  
Coating Inspection; surveys; appraisal reports; troubleshooting, seminars.

**University of Manchester Institute of Science and Technology (UMIST) – Corrosion and Protection Center**, Manchester, England.  
*Professor (tenured lecturer).* 1968 – 1985  
Teaching and research – MSc course in Corrosion Science and Engineering; — MSc course in Terotechnology. Design and materials selection, basic corrosion principles; atmospheric corrosion; high temperature environments, troubleshooting and failure analysis, etc.

**Corrosion And Protection Centre Industrial Services, (CAPCIS).** Manchester, England.  
*Senior Consultant.* 1973 - 1985  
UK and worldwide advisory and consulting work; site surveys; laboratory testing and simulation; failure analysis, litigation/insurance work, etc.

**Center for Professional Advancement (CfPA)**, East Brunswick, NJ; Amsterdam, Netherlands.  
*Faculty Staff.* 1976 – 1990  
In house – USA and worldwide: seminars on industrial corrosion, and oil/gas corrosion.

**Imperial Chemical Industries – Metals Division, (IMI), Ltd.**, Birmingham, UK.  
*Project Officer.* 1965 - 1968  
R/D on materials for aerospace and gas turbine industries; general work with IMI products – copper, titanium, etc.

**University of Madison - Wisconsin.**, Madison, WI.  
*Visiting Lecturer.* 1995 - present  
Seminars on The Utilization of Stainless Steels and Overcoming the Challenge of Corrosion.

**NACE International**, Houston, TX.  
*Faculty.* 1995 - present  
2-day seminar “High Temperature Corrosion”.

## PROFESSIONAL AFFILIATIONS

### **INSTITUTE OF MATERIALS, MINERALS & MINING** (formerly Institute of Metals)

- Member (1963-1995).
- Fellow (1995 - present).

### **ASM INTERNATIONAL** (American Society of Metals)

- Member (1986 – present).
- High Temperature Materials Committee, (1986 – present).

- Co-Chairman: Energy/High Temperature Corrosion Symposium, (1987).
- Chapter Editor: Materials & Design, Corrosion Handbook, volume 13A, (2001 – present); editorial input to Corrosion Handbook, volumes 13B, (2003-2005) and 13C, (Nov., 2006).
- Honorary Faculty Member: Principles of Failure Analysis, (2004).

**INSTITUTE OF CORROSION (I.Corr)** (formerly Institution of Corrosion Science & Technology)

- Member (since 1974).
- Chairman (1984-1986).
- Fellow (1997- 2008).

**NACE – INTERNATIONAL** (formerly National Association of Corrosion Engineers)

- Member (Jan 1982 – present);
- Corrosion Specialist (1995 – present).
- NACE Fellow (1998 – present).

**Standing Committees:**

- Accreditation – Exams Sub Committee; Vice Chairman (1994 - 1997).
- Awards Committee (1994 - 1997); Awards Sub Committee (2006 - current).
- Career Development Committee (1989 - 1993).
- Product Development Committee, Chairman (1986 - 1993).
- Government & Intersociety Committee, Member (1982 -1993).
- International Relations Committee (1982 - 1993); Vice Chairman (1991 - 1993).
- Nominations Committee (1983 -1987).
- Professional Development Committee (1996 - 2002); Quality Control Sub Committee, Chairman (1999 - 2002).

**Specific Technology Groups (STG's) – previously TPC:**

- STG 34 Petroleum Refining & Gas Processing [T-8].
- STG 36 [T-5, 5A] Process Industries, Chemicals.
- STG 37 Process Industries, High Temperature [T-5B].
- STG 41 Energy Generation [T-2].
- STG 43 Land Transportation [T-14].
- STG 45 Pollution Control, Waste Incineration etc.
- STG 46 Building Systems

**Special Groups/Committees:**

- Trustee (alternate) to Federation of Materials Societies (1987-1990).
- Reference Publications Committee (1993- present).
- Vice Chairman/Chairman to Symposia on High Temperature Materials Utilization (1989); Materials For Fossil Fuel & Conversion Service (1990); High Temperature Halogen Corrosion (1995); Temperature Materials in Aggressive Environments (2000).

**MISCELLANEOUS APPOINTMENTS & SERVICES**

- UK GOVERNMENT. Member, Working Party on Education & Training - Committee on Corrosion (1972 - 1982).  
Technical Support, Overseas Development Administration (1981-1986), IIE, Cuernavaca, Mexico.
- NICKEL DEVELOPMENT INSTITUTE (NiDI). Consultant. (1990 - 2000).
- COPPER DEVELOPMENT ASSOCIATION. Consultant. (2009-present).
- GUIDELINE (TELTECH) – Resource Network Corporation. Expert. (1993 - present).
- WHO'S WHO – Environmental Registry. (1992 – present).
- INTERNATIONAL BIOGRAPHICAL CENTRE, Cambridge, UK. Leading Scientists of the World Certificate. 2010.

## **PUBLICATIONS**

Author of approximately 100 technical papers on:

- materials performance
- aqueous & general corrosion
- high temperature corrosion
- engineering design
- risk assessment & awareness
- corrosion technology transfer

*(List attached or available upon request)*

## **PRESENTATIONS**

Over 100 presentations, including:

- plenary lectures
- invited lectures at international conferences and local professional societies
- radio and television presentations
- video presentation on designing for corrosion control
- high-temperature seminar for NACE (author and presenter)
- corrosion control for food processing industries (NiDI presentations)

## **EXPERT TESTIMONY**

Testified in trials and depositions, including End-Dispute and other arbitrations in USA and overseas, including South Africa and Venezuela. Court-qualified as an expert in metallurgy, materials engineering, failure analysis and corrosion, etc.

*(List of prior testimonies attached or available upon request)*

## **SEMINARS/COURSES**

Customized presentations for clients worldwide, including seminars or short courses held at universities, private companies and for professional societies. Focused topics include: Approach to Failure Analysis; Materials Selection & Design; Overcome the Challenge of Corrosion; Designing to Minimize Corrosion; High Temperature Corrosion.

Past courses include: Industrial Corrosion, {CfPA}; Oil & Gas Corrosion, {CfPA}; Corrosion in Food & Beverage Industries, {NiDI – USA and Mexico}; The Utilization of Stainless Steels, {University of Madison, Wisconsin}; Overcome the Challenge of Corrosion, {University of Madison, Wisconsin; IVEPE – Greece}; Principles of Failure Analysis, {ASM International}.

*(Further details available on request)*