



## Company Profile: Engineering Services

### **Induction Group Background**

Induction Group consists of an Australian-owned conglomerate of corporations newly integrated into a single collaborative entity, with strength and expertise in specific areas of operation. Our engineering division consists of 5 staff with over 130 years of combined experience, and is headed by Trevor Rowlands, Engineering Director.

Featuring materials, structural and maritime engineering capabilities with a long history of diverse industry and private consulting experience, Induction Group offers turnkey support through the life cycle of all engineered materials to companies in Australasia and beyond.

### **Capabilities**

#### 1. Specification Writing

- Raw material through to surface finishing

#### 2. Materials Selection Consultancy

- New designs
- Reverse engineering or remediation for existing designs
- Improvements to existing design to improve durability

#### 3. Manufacturing Optimisation Consultancy

- Heat treatment
- Surface finishing:
  - paints and powder coating
  - electroplating
  - galvanising
  - anodising
  - conversion coating
  - passivation

#### 4. Forensic Failure Investigations

- Identification of failure mode and root cause
- Recommendations on recurrence prevention

Induction Group Pty Ltd

Factory 7, 993 North Road Murrumbidgee VIC 3163

T: 1300 239 644 E: [enquiries@inductiongroup.com.au](mailto:enquiries@inductiongroup.com.au) A.B.N.: 76 613 229 226 [www.InductionGroup.com.au](http://www.InductionGroup.com.au)

- All infrastructure materials
  - metals (steel, aluminium, copper alloys etc.)
  - plastics, rubbers, adhesives
  - ceramics (glass and glazing, natural and artificial stone, tiles)
  - composites (concrete, plaster, synthetic floors etc.)
  - plumbing system failures
  - surface finishing
  - corrosion assessment of all metals
  - environmental degradation: materials & coatings

## 5. Structural Design and Forensic Investigation

- Residential, industrial and commercial buildings
- Services include:
  - site inspection, investigation and determination of cause(s) and extent of building / structural distress
  - urgent response for Immediate Make Safe issues
  - provision of engineering reports, Scope of Works and tender documents, including upgrade and reinstatements works
  - expert witness services
  - project management and construction phase services

## 6. Condition Assessment and Monitoring

- Specification of appropriate methodologies for assessment
- Specialised applications or complicated or extreme service environments
- Critical assets of high consequence: assistance with prioritising critical components or infrastructure
- Recommendations & remediation advice
- Evidence of degradation, and mode
- Pipelines, chemical processing facilities, building infrastructure, aquatic centres, playgrounds, sports facilities and other structures

## 7. Weld Fabrication

- Procedure specification and review
- Testing and assessment to Australian and international Standards

## 8. Testing Services

- Methods and specification of relevant test regimes
- Testing Services
  - Non-Destructive (on site):
    - Visual and stereographic inspection
    - Coating thickness (paints & other coatings)

- Concrete cover
- Half-cell potential (reinforcing corrosion assessment)
- Schmidt hammer test (concrete compressive strength)
- Pit depth measurement (corrosion)
- Holiday testing (coating porosity, perforation)
- Degree of cure (coatings)
- Soluble Fe salts (underfilm steel corrosion)
- Liquid penetrant inspection (all metals)
- Magnetic particle inspection (ferromagnetic steels)
- Ultrasonic thickness evaluation (remaining steel & aluminium thickness)
- Destructive (samples removed):
  - Pull-off adhesion (coating adhesive strength)
  - Mill scale presence (steels)
  - Metallographic examination (metallic microstructure)
  - Hardness testing (metals, plastics and rubbers)
  - ICP-AES (Chemical analysis of metals): compliance
  - FTIR Chemical analysis (coatings and plastics): compliance & environmental degradation)
  - DSC analysis (plastics e.g. piping)
  - NMR analysis
  - GCMS analysis
  - OES for metals
  - TGA analysis
  - Environmental degradation
  - SEM and EDX analysis (all materials) – impurities, very small sample only
  - Optical microscopy
  - Weld examination
  - Tensile/compression
  - Chemical analysis (all materials)
    - Tensile
    - Load
    - Impact
    - Fatigue

## 9. Maritime Engineering

- Consultancy services for Marine Engineering and Quality Management systems:
  - General marine engineering, supervision of repairs and maintenance including naval architecture and vessel operations incorporating statutory and classification rule requirements
  - Specification writing and plan approval for modifications, repairs and concept designs
  - Detail and design drafting utilising computer technology and traditional methods
  - Routine survey, planned maintenance and drydock supervision

- Liquid and dry bulk cargo operations and maintenance
- Sourcing and purchase of equipment and contracts for services
- ISO/ISM lead audits
- Oil Companies International Marine Forum accredited Offshore Vessel Inspections
- Det Norske Veritas Environmental Management Systems
- Det Norske Veritas Incident/Accident Investigations
- Root Cause Analysis and Risk Management
- Project management and supervision of dry-dockings, repairs and maintenance, conversions and major overhauls of machinery including writing specifications for work, budgets, monitoring progress and final reporting
- Development and implementation of task related computer models to monitor budgets, track stores, consumable and spare parts and prediction of forward trends
- Conceptual design, project management, supervision and commissioning of purpose built vessels to meet owners requirements, including work boats and barges
- Low Location Lighting audits

## 10. Expert Reports

- Concise and structured such that mode of degradation or failure, and root cause are clearly identified

## 11. Expert Testimony

- Evidence has previously been provided to VCAT, Magistrates, County and Supreme Courts

## Engineering Experience:

Examples of investigations respecting which our Principals have been involved include:

- Failure and root cause analysis for multiple Defence and Civil platforms
- HMAS Cerberus, Victoria: Structural investigation and repair of a number of distressed structures, including structural upgrade rectification works for the Gas Fired Fire Fighting Unit at the Shipping Training Facility
- RAAF Engineering Design Authority for airframe and undercarriage components; material specification, thermal treatments, non-destructive inspection, shot peening, surface finishing and painting
- Project managed NADCAP (National Aerospace and Defence Contractors Accreditation Program) certification for a large number of special processes including hard chromium plating, cadmium plating, nickel plating, chromic acid anodizing, sulphuric acid anodizing, hard anodizing, phosphate conversion coating, chromate conversion coating, magnetic particle NDT, liquid penetrant NDT, shot peening, temper etch inspection and painting.
- Inpex Ichthys \$50bn LNG Plant, Darwin: protective coating assessment, documentation review, remediation and specification
- Design and documentation for the reinstatement of the Shepparton Brick and Paving Pty Ltd steel framed portal structure which had collapsed in storm conditions.
- Black Saturday bushfires: forensic assessment and failure analysis of electricity distribution porcelain insulators (Beechworth) and transmission towers (Kinglake) for class actions
- MCG: Inspection and report on the existing condition and protection coating of each of the six floodlight towers and headframes.

- Project management for the investigation, technical review and report of the collapsed cooling tower at the Alcoa Anglesea Power Station in March 2001. The 54m x 16m x 14m high all-timber structure was found to have overloaded columns which had suffered timber decay. The investigation established the cause of failure and included recommendations for rectification.
- Victoria Police Major Collisions Unit: Failure analysis of petrol tanker tow hitch for Coronial Inquest
- Rio Tinto Brockman 4 iron ore mine, Paraburdoo WA: assessment and failure analysis of 4km of degraded polyethylene piping
- Design and documentation for rehabilitation of the Launceston Margaret Street underground brick-barrelled combined sewer/stormwater outlet (1.1km long), requiring internal RC shotcrete shell.
- Eureka Tower, Melbourne: failure analysis of fire system plumbing that flooded approximately 40 floors deserve
- Farstad Shipping (Indian Pacific) Project Management:
  - Design, superintendency and commissioning of repairs and maintenance, dry-dockings, major conversion work and damage / breakdown repairs.
  - Plan approval for new PSV and AHTS vessel construction for Farstad Fleet
  - Supervision of construction, outfit and machinery installation for new constructions. Represent Owner's interests at Owner acceptance trials and commissioning.
  - Upgrade of existing planned maintenance and safety management system on board company vessels located in SE Asia region
  - Introduction of vessel and Office ICT systems to vessels to support new planned maintenance, Safety management, Quality and Document control systems
  - Integration of ICT systems with satellite communication systems, and existing vessel alarm monitoring and control systems
- Sandown Racecourse, Melbourne: forensic assessment of fire damaged and non-fire damaged infrastructure
- Altona water recycling plant: identification of corrosion mechanisms and determination of root cause of failures in stainless steel piping
- Various Victorian aquatic centres: pool tile delamination and failure of roof support struts (stress corrosion cracking)
- Quality Assurance Management, HSEQ Management, Designated Person Ashore, Company Security Officer, Farstad Shipping (Indian Pacific) Pty. Ltd. Responsible for Internal and External Audit programme for up to 28 ships and 3 regional offices to International Safety Management Code, International Ship and Port Security Code, Maritime Labour Convention, ISO 9001, ISO 14001 Standards. Management of external Client audits to OVID, CMID and Client specific audit programmes

Should you have any questions or require assistance, don't hesitate to contact us directly.



Trevor Rowlands

**Engineering Director | INDUCTION GROUP**