

# TRANSFORMER CONSULTING SERVICES



Doble Power Services leverages the resources of Doble's extensive library and experienced engineering team to deliver the highest level of consulting services and knowledge-based solutions.

Constituting one of the largest investments in a utility, plant or industrial system, transformers are extremely critical apparatus for providing reliable energy flow. Procurement has become global, driven by capacity shortfalls and an ongoing search for cost-effective purchasing.

Doble engineers help mitigate risk by assisting clients in preparing transformer specifications, auditing individual factories for capability and performance, evaluating proposals, overseeing design reviews, conducting factory inspections and witnessing factory tests.

## WHY HIRE EXTERNAL TRANSFORMER CONSULTANTS?

- Verify specific requirements are met during the design and production processes
- Mitigate transformer schedule risk
- Establish a clear, communication line between the client and manufacturer
- Address problems before transformer leaves the factory to avoid high cost and delays associated with field repair
- Represent your interests with specialized expertise in design, manufacturing and factory testing of power transformers

## PARTNERING WITH DOBLE POWER SERVICES PROVIDES THE FOLLOWING BENEFITS:

- Knowledgeable team of transformer design and consulting engineers for critical or long-term replacement projects requiring highly specialized engineering resources
- Extensive global experience, especially important when considering new off-shore transformer suppliers (Asia, South America, etc.)
- Latest transformer design and evaluation criteria for new engineers who may be working with outdated specifications
- Independent, expert opinion during the entire procurement and commissioning process

## DOBLE POWER SERVICES OFFERS THE FOLLOWING EXPERT CONSULTING SERVICES:

- Specification writing and review
- Factory audits
- Proposal evaluation
- Transformer design review
- Independent inspection and test witnessing
  - > Core and coil inspection
  - > Pre-processing inspection
  - > Pre-tanking inspection
  - > Acceptance testing



## SPECIFICATION WRITING AND REVIEW

The Doble design engineer and client will identify details of the client's transformer application including:

- Loading requirements
- Environmental conditions
- Voltage variations
- Short circuit stresses

The Doble engineer then utilizes his experience in transformer design to translate client's needs into a purchase specification incorporating state-of-the-art design, manufacturing and testing requirements that are tailored to meet the demands of the client's specific application.

## FACTORY AUDITS

Doble will perform a comprehensive review of the transformer factory and procedures including:

- Design
- Manufacturing
- Quality assurance and control
- Supply chain
- Problem mitigation

The audit also assesses productivity, delivery performance, process control metrics, general safety practices, technology level, quality records, service history, training programs and management philosophy. Plant layout, cleanliness, modernization and throughput are other important parts of the audit.

## PROPOSAL EVALUATION

The Doble engineer incorporates their knowledge of the various transformer designs and capabilities of the manufacturers to perform a comprehensive evaluation of bids for new or rebuilt units. Factors involved with a comprehensive evaluation include:

- Specification considerations
- Past performance
- Schedules
- Application needs
- Factory capabilities and condition
- Workmanship and reliability considerations

## DESIGN REVIEW

The Doble engineer meets with the manufacturer shortly after the award is executed. The transformer manufacturer provides detailed technical information on the thermal, dielectric and mechanical aspects of the transformer design. Materials, electrical clearances, oil flow, conductor properties and many other design aspects are thoroughly reviewed to ensure that the technical requirements of the client's specification are fulfilled.



## INDEPENDENT INSPECTION AND TEST WITNESSING

After the manufacturer obtains design approval, manufacturing of the transformer begins. The various stages of the construction process are then monitored at pre-selected surveillance points to ensure that a high quality product free of defects is provided.

### Common selection points include:

- Core and coil inspection
- Pre-processing inspection
- Pre-tanking inspection
- Acceptance testing



## Why Doble Power Services?

### Extensive Global Experience

Doble has more than 40 consulting engineers each with extensive experience in power systems engineering applications.

### Independent Expert Opinion

Trust Doble's expert consulting & testing services for unbiased diagnosis and assessment of critical assets.

### Doble Peer Review Process

When you hire Doble, you are hiring the shared experience of our entire engineering team. Each Doble field service report is reviewed by at least one other consulting engineer.

### Doble KnowledgeBase

Provides valuable benchmark data for use in evaluating test results on your equipment.



### Doble Engineering Company

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