



# THIRD PARTY ENGINEERING DESIGN AUDITS

## WHY ENGINEERING DESIGN AUDITS?

When people speak of quality control, it is typically with reference to the adherence of a manufactured product to required specifications. A different and equally important type of quality control deals with performing engineering design audits, i.e., engineering quality control of systems, equipment, and components. The goal of this approach is to identify deviations from specifications and accepted engineering practices while the designs are still on paper, before they have been fabricated and installed. The cost and time spent performing this work is small compared to the potential impact that undiscovered discrepancies may have on operating units.

The hydrocarbon processing industry has undergone major personnel changes in recent years. As a result, companies generally have lower manpower and average experience levels than they had ten years ago. This is true at owner companies, contractors, and equipment manufacturers. Engineering quality control has always been important. However, the personnel changes the industry has undergone make it even more so today.

Depending on the needs, engineering design audits may be focused on a small number of critical equipment items, or they may be applied on a wider basis to major capital projects. In the latter case, carefully developed screening procedures are used to check contractor and vendor performance on a sampling basis, determine the level of engineering quality, and recommend corrective actions as required.

## OUR EXPERIENCE:

Carmagen Engineering has developed plans for and executed engineering design audits for major capital projects worldwide. These have included projects located in Greece, Indonesia, Korea, France, Saudi Arabia, and the United States.

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Profit Improvement

Process/  
Equipment Audits



# ENGINEERING STANDARDS AND SPECIFICATIONS

## HOW CARMAGEN ENGINEERING CAN HELP:

A company's engineering standards and specifications are fundamental to the safety, reliability, operability, maintainability, and cost effectiveness of its process plants. Unfortunately, maintenance and updating of engineering standards is often neglected.

- Budgetary constraints often result in the standards maintenance function being drastically curtailed or eliminated.
- In times of high work load, the engineering staff is often too busy with more immediate needs to give the company standards the attention they require.

Maintaining, revising, and writing new engineering standards is not glamorous nor "high tech" work. But it is necessary, especially in these times of lower manpower and average experience levels of company engineering staff and increased regulatory attention.

Carmagen Engineering can assist in this area by focusing on your standards and not being distracted by the other demands that your engineering staff must deal with. Our approach is to learn as much as possible about our client's needs and engineering design philosophy, develop drafts of the appropriate revisions or new standards, and discuss these with your engineering staff until final agreement is reached. We do not replace your staff in this important function, but relieve them of most of the burden. They can focus only on information transfer and review without the burden of checking for consistency, compliance with industry standards, and production.

## WORK EXAMPLES:

- Maintained and revised piping, pressure vessel, and storage tank standards for an international oil company.
- Revised and wrote new piping, pressure vessel, and storage tank standards for an international chemical company.
- Wrote new piping standards for a domestic petroleum products marketing company.
- Wrote new piping and pressure vessel standards, and piping material specifications, for a German chemical company building a plant in the United States.
- Consolidated and revised piping material specifications for a domestic chemical company.
- Developed background documents that explained the underlying reasons for requirements contained in specific engineering standards.

These provided a mechanism to help preserve corporate know-how.

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Project Planning  
and Execution

Quality  
Assurance