

## Transforming the Role of the Engineer

### Key Points

- Fifty-five percent of engineers feel their greatest challenge is trying to do too much with too few resources.
- In addition to technical skills, companies are looking to hire engineers that can lead a project or team.
- Creative thinking and an "out-of-the-box" approach are critical in gaining market share and remaining cost effective.

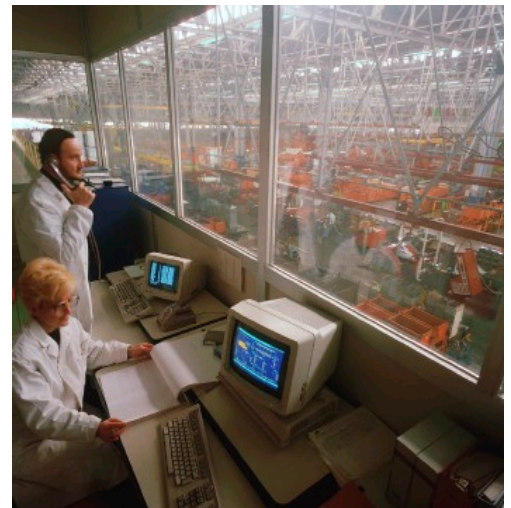
Technology and organizational changes have greatly impacted the roles and responsibilities of plant engineers. Historically, plant engineers developed blueprints on paper and designed equipment that was manually operated. Today, engineers are using the latest technology with 2D-CAD and 3D-solid modeling, computer-aided simulation, equipment-design software, and high-tech automation. Reid Supply Company offers [FREE CAD Images](#) to engineers via their web site, [ReidSupply.com](#). Engineers are expected to wear many hats, requiring them to be more creative while managing new technology and design outsourcing.

## New Responsibilities

In a recent survey by Design News, 44% of the participating engineers stated that they are using more technical disciplines than they were a year ago and anticipating a more diversified workload over the next five years, with more emphasis on design work. Some engineers have already expanded their work responsibilities and believe they will need to have a broad set of skills in order to be promoted. Some of these competencies were noted to be project management, computer-use, communication, team building, marketing and sales, as well as finance and accounting skills.

Engineers have been taking on more responsibilities over a wider range of projects, with more emphasis on automation design in addition to the traditional mechanical, structural, and electrical design. According to a recent survey by [Plant Engineering](#), 41% of the engineers that participated identified "keeping up with technology" as one of the biggest challenges they face. In addition, the survey revealed that plant managers view the responsibility of managing the automation system as a shared process with the IT department—a process that will likely stay the same, or increase, over the next few years. Collaboration among departments within a manufacturing facility, and at least a basic understanding of the process control system have become essential to the implementation of successful projects.

Sixty-five percent of the engineers surveyed by *Design News* indicated that their ability to be creative and innovative in their role is very important. As the world market becomes more competitive, with an increased global presence, today's engineers need to create more innovative products and design more efficient systems. Creative thinking and an "out-of-the-box" approach are critical in gaining market share and remaining cost effective.



Plant engineers are changing their way of thinking and the approach to their role in meeting the challenges that face them. In fact, Kelly Engineering Resources (an engineering recruiting firm), indicated that its customers are seeking candidates with more "soft skills," like leading a project or team. These skills allow engineers to maintain a focus on the entire business rather than limiting their responsibility to project completion, maintenance, and increased capacity, which is not the core business of the company.

## Outsourcing

A growing trend among manufacturing companies is the outsourcing of design work. According to *Design News*, 78% of companies are contracting aspects of their design work to independent firms. On average, these companies are outsourcing 9% of their total amount of design engineering work (up from 7% in 2006).

- Mechanical design—37%
- CAD—29%
- Board-level design—26%
- Test and measurement—23%
- Circuit design—22%

- Systems design—21%
- Applications engineering—17%
- Other (structural, mechanical, and packaging)—18%

Some attribute increased outsourcing to the fact that companies are trying to remain lean by using their manpower differently and contracting work out when the load peaks. Other companies, such as Kerk Motion Products, provide design and drawings to manufacturers overseas for assembly. Engineers in these roles have not been affected by outsourcing, since they continue to provide layout and design of equipment, even though an independent company manufactures the product.

## Challenges

Plant engineers continually need to adjust in order to meet the challenges of the dynamic plant environment, as companies attempt to become more efficient in their operation. *Plant Engineering* magazine and Cahners Research conducted a study of the Role of the Plant Engineer in 2000. In this study, plant engineers identified their greatest challenges:

- Trying to do too much with too few resources—55%
- Training/education/skill of workforce—55%
- Budget restrictions—51%
- Keeping up with technology—41%
- Speed of change—34%

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