

R&D Tax Credits Case Studies: A/E/C

The following are two examples of client development efforts in the A/E/C industry which further illustrate the types of projects and activities that will potentially qualify for the R&D tax credit. The eligibility of specific projects, activities and expenditures will depend upon a closer examination of the facts and circumstances in relation to applicable guidance.

New Building Design

Company designed a new laboratory science building for a major university. The facility was being designed to dramatically improve the building's functionality, utility, quality and reliability. Because the company was designing the building for use as a scientific laboratory there were certain stringent criteria that had to be met, both for specific pieces of operating equipment and for several sensitive areas of the structure. The company had no prior experience in meeting such criteria and technical uncertainty was therefore prevalent throughout. An enormous amount of technology was incorporated into the design plans both for added functionality and performance and to make the building an inspiration for students. The building was also designed for LEED certification and therefore held to exceptionally high energy and environmental standards.

A major area of experimentation in the project was the vibration criteria which had to be met in order to guarantee that technical equipment being installed in the lab would function properly and for certain sensitive areas of the laboratory where testing would be performed. There were numerous mechanical challenges in terms of limiting vibrations from numerous sources which all had to be overcome, verified and documented. Wind turbines were installed and then removed as a part of this process. This project also included design of a unique spine-like lateral system in support of a two story glass curtain wall using a cable system. This approach had never been attempted before by the company. After extensive analysis of the expenditures and activities involved in this project, it was determined to qualify for purposes of the R&D tax credit.

Power Plant Retrofit Evaluation

Company evaluated the potential retrofit of a power station with wet mechanical draft cooling towers, as well as a wide range of alternative technologies in order to assess and mitigate its impacts to air quality, aquatic and terrestrial resources, climate change, and a range of other environmental areas. In doing so, they developed modeling techniques for assessing the air quality impacts on surrounding land uses of salt water drift from the cooling towers' exhaust stack. They also developed a process for evaluating and documenting the feasibility of retrofits employing a range of technologies, including different types of cooling towers—mechanical draft, natural draft, in-line and back-to-back; and other alternatives such as air cooled condensers, indirect dry cooling, use of groundwater and sewage treatment plant effluent for once-through cooling, and reverse-osmosis desalination of cooling tower make-up water. This project was instrumental in developing the firm's capabilities for evaluating power plant retrofits from an environmental and engineering perspective.

Activities in the project relied extensively upon the principles of physics, chemistry, mathematics, atmospheric and climate science, acoustics, terrestrial and aquatic biology, ecology, thermodynamics, fluid mechanics, mechanical engineering and chemical engineering. There was a process of experimentation throughout the project in which the feasibility of several power plant retrofit alternatives were evaluated and the most appropriate ways to model and mitigate air quality impacts were developed. After extensive analysis of the expenditures and activities involved in this project, it was determined to qualify for purposes of the R&D tax credit.



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