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*For your
information*

CAPABILITY STATEMENT
Energy Efficiency and Carbon Dioxide Reduction
A Materials Solution

INTRODUCTION

McWane and Associates provide engineering support and consulting in welding, metallurgical, and materials engineering necessary to improve solar thermal steam power plant energy efficiency and carbon dioxide reduction.

PROBLEM

One method of increasing the solar-to-electricity efficiency, and reduce electricity cost in solar thermal power plants, and reduce carbon dioxide emissions in hybrid fossil-solar thermal plants as required by environmental laws, is to operate the steam power plant at higher temperatures and pressures than currently used. However operating at higher temperatures and pressures increases wear and tear on the materials of construction, that can shorten the material's life and lead to premature material failure, unexpected outages, and life threatening steam releasing accidents. Therefore to resist the effects of higher temperature and pressure wear and tear, newly developed advanced high temperature materials must be used. In addition to selecting the proper newly developed high temperature materials to be used, the selected materials must also be properly fabricated and welded, to preserve their long term high temperature properties for the life of the plant.

And adding to the problem, most firms hired to design, build, or upgrade the power plant with advanced higher temperature materials, typically has no one on their staff with a material or metallurgical engineering degree to properly specify advanced high temperature materials, and no one with a welding engineering degree to properly specify fabrication and welding of advanced high temperature materials, and no quality system to prevent or detect problems and mistakes. And as a consequence unnecessary common costly mistakes are made when designing, selecting materials, specifying, or performing welding, heat treating, forming, or other material processing methods. A case in point are the attempts of some utilities, their engineers and designers to specify advanced power plant material SA 335, Grade P91, 9Cr-1Mo-V steel pipe, because of its long term high temperature properties. And as a result having the material fail prematurely due to improper fabrication, welding, and heat treating procedures used by contractors and maintenance personnel. These mistakes and the business as usual attitudes that are responsible for these premature failures are unacceptable, and cannot continue if the high temperature property advantages of newly developed advanced materials are to be used successfully to improve power plant efficiency and reduce carbon dioxide emissions.

SOLUTION

You can prevent common costly mistakes and protect your investment, by using engineering support and consulting to advise you on matters of welding, metallurgical, and materials engineering needed to fabricate and weld newly developed advanced high temperature materials that are required to support the higher temperatures and pressures, as a result of current and future changes in requirements for energy efficiency and carbon dioxide reduction.