



AMERICAN PETROLEUM INSTITUTE

API Technical Report 942-A

Materials, Fabrication, and Repair Considerations for Hydrogen Reformer Furnace Outlet Pigtails and Manifolds

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The American Petroleum Institute (API) Committee on Refinery Equipment, Subcommittee on Corrosion and Materials undertook a project to develop this technical report on materials, fabrication, and repair issues related to hydrogen and syngas reformer furnace outlet pigtailed and manifolds. High reliability of outlet pigtailed and manifold components, such as headers, tees, and fittings, is important to the successful long-term operation of hydrogen and syngas reformer furnaces. These components typically operate at high temperatures in the range of 750 °C to 950 °C (1382 °F to 1742 °F) where they are potentially subject to high-temperature creep, stress relaxation, hot corrosion, and thermal fatigue damage.

In recent years, a number of reformer furnace operators have encountered problems of in-service degradation and cracking of outlet pigtailed and manifold components, while others have had little or no problems of this type. Both direct experience in addressing specific cases of outlet pigtail and manifold cracking problems and indirect experience gained from surveying industry with regard to these problems were used in preparing this report.

The objective of the project was to develop an understanding, based on published literature and industry experience, of why some reformer furnaces have had problems with embrittlement and cracking of outlet pigtailed and manifold components in service while others have not had such problems.

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