


کد سند: RO-S-F-28-02	معاونت پژوهشی	
تاریخ صدور: ۱۳۹۹/۴/۲۲		
تاریخ ویرایش: ۱۳۹۹/۵/۱۵	فرم خلاصه انگلیسی طرح / پروژه	

Project Title: Failure analysis of gas turbine first stage blade (Persian Gulf power plant)

Department:	Metallurgy	Employer:	Persian Gulf electrical power company
Project/Program Manager:	Aliakbar Fallah Sheykhleri	Executor:	Masoud Hasani Marzouni
Project Financial Code:	9450	Project Quality Code:	CGPG01
Type of Project/Program:		Assistant:	Research board

Project Staff: Saeed Khani Moghanaki

Keywords: GT13E2 Gas turbine, Bracket, Inner cooling panel, Inner bypass panel, Combustion chamber, Dimensional tolerances, Zone 2, Thermal stress.

Project Necessity: The necessities of the present project are the following items: 1- to prevent similar failure in the power plants, 2- To reduce major overhaul costs, 3- to reduce the costs of power generation stops, 4- to provide stable power, and 5- to reduce the number of unforeseen overhauls.

Project Goals: The main goal of the present project is failure analysis of GT13E2 gas turbine first stage blades.

Abstract: In the present study, failure analysis of gas turbine first stage blades was performed by utilizing standard methods. The microstructures and fracture surfaces of the blades were investigated by optical microscope (OM) and field emission scanning electron microscope (FESEM). EDS chemical analysis results illustrated that the iron content was surprisingly high in the damaged zones. The burners air path inspection showed that some brackets of inner cooling panel were missed and separated from their location and others were severely worn. Quality control documents of Zone 2, including the brackets, inner bypass and cooling panels, showed that dimensional tolerances were not met and this led to abnormal and higher thermal stress development during service. This thermal stress can separate brackets of panels and they move toward the first stage blades. This can damage the combustion chamber and the blades.

Steps and Methodologies: The experimental procedures of the present report are as following: 1- investigations on the pictures and films, 2- operation history, 3- investigation on the damages type, 4- visual inspection, 5- microstructural investigations, 6- farctography, and 7- providing solution.

Main Results (technical outputs, patents, papers, books, reports, etc.):

The report was sent to Persian gulf electrical company.