

Second Winner

Applied Research

Project Title

**Technology Compilation & Production of one Set of First Stage Nozzle and Related supplements of 25 MW Gas Turbine**



**Initiator:** Sistan & Baluchestan Electrical Regional Co. -**Tavanir CoContributor:** Tajrobeh Noor Production Management of Turbine Components Co.

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**Representative: M. R. Zamani Meighan (MSc)**

**Colleagues:** A.Kiani Rashid (PhD), G. Rakhshani Mehr (MSc), S.F. Hazavehei (MSc), H.Arab Ameri (MSc), A.Samadi (MSc), M. Kamali(BSc), M. Sohrabi(MSc), M. R. Khakpoor(MSc), S. Bikass(MSc), A.Doust (MSc) M. Hosein Zadeh (MSc), M. Memari(MSc), S. Taremi(MSc), A. Bahrami(MSc), J. Ragh(BSc), S. Sahakian(BSc), A. A. Jam(MSc), A.A.Ahmadi Moghadam((BSc), F. Sharifi

**Abstract**

Gas turbine nozzle is one of the parts that can resist several damaging factors such as: creep, thermal fatigue, high temperature corrosion and etc and has a main role in increasing the efficiency of gas turbine. The aim of this project was to obtain the technical knowledge of manufacturing the first stage nozzle of GE F5 gas turbine along with all its supplements. Successful completion of this project in Iran will create a suitable background to produce similar parts. In addition, due to the consumable nature of these turbine nozzles, by virtue of this project, the exit of huge amount of foreign exchange to other countries can be prevented. The results of the project included obtaining the manufacturing technology of the multi-vane nozzle segment and casting, machining and heat treatment of FSX-414 Cobalt-base super alloy. The procedure for performing this project consisted three phases: obtaining technical specifications, developing manufacturing technologies and producing one set of these pieces. The results of conducting these phases included all of the technologies related to manufacturing the nozzle such as production of ceramic core, wax montage, ceramic shell, investment casting, heat treatment, welding, grinding, CNC milling, super drill, carousel, bending, trimming, CNC boring, pressing, drilling and manufacturing various dies, gauges, jigs and fixtures. It is worth mentioning that all the aforementioned items have been done for the first time in the country.