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## SCIENTIFIC & RESEARCH PROJECTS

**Project No.: 01**      **Year: 2012**

**Project Field: Hydrogen Management**

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### Project Title:

**Comprehensive Modeling of Hydrogen Network in Petrochemical Complexes**

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### Abstract:

Hydrogen is an important utility gas, which is used in various operations in petroleum refineries and petrochemical complexes. Although hydrogen is produced as by-product in petrochemical complexes, however it is not efficiently used and mostly sent to fuel. Most current works have applied hydrogen optimization approach for refineries. Therefore, this study is aimed to propose a new optimization mathematical model for hydrogen management in petrochemical complexes based on setting a comprehensive superstructure model. This superstructure including purifier and compressor of hydrogen plant or catalytic reformer unit offers more improvements. Having applied the proposed superstructure in two industrial petrochemical complexes, the results indicated that about 16.7 % reduction in hydrogen consumption could be achieved with a payback of 2 years.