

Fire Stations Manning and Business Planning Model: Case Study

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Abstract

This paper presents a case study conducted for 47 Fire Stations that involves determining manning requirement for Fire Fighters; and provide a model whereby Fire Department could use to adjust existing or determine new Fire Station manning requirements. The model uses a recursive calculation process which can be broken down to 3-stages. In first stage, initial crew size per fire apparatus was determined using a complexity index that captures the fire station profile from its nearest support, type of coverage, and its risk classification. In second stage, the number of fire apparatus for initial effective response was determined by ensuring each fire station can cover 90% of their incidents on their own with a supplemental support from nearby fire stations and in cases where a fire station is remote, the number of fire apparatus was adjusted to ensure those stations can provide effective response. In third stage, the manpower requirements per shift were determined using the results from the two stages along with incorporating applicable international and local standards. Then, manning requirements in stage 3 were used to build a business planning model to perform scenario planning for changes in existing fire station profile or addition of new fire stations.

Keywords

Fire Station; Fire Fighters; Business Planning Model

Biographies

Abdulaziz S. Alzahrani is currently working as Organization Performance Advisor at Saudi Aramco and has more than 6 years of total professional experience in various fields from IT Project Management, Business Process Re-engineering, and Management Consulting. Abdulaziz earned his bachelor's degree in Industrial & Systems Engineering from King Fahad University of Petroleum & Minerals (KFUPM) in January 2013, and currently pursuing his master from the same institution. He has also earned the Lean Six Sigma Black Belt designation from the International Association for Six Sigma Certification (IASCC) in January 2014. Abdulaziz also highlights his Professional Interests as Data Analytics, Manpower Optimization and Modelling, Operation Research, and Business Analysis.

Suhail N Shami is a management consultant at Saudi Aramco. Suhail earned his bachelor's degree in industrial engineering from the University of Houston in May 2016. Since his graduation, he has been involved in many projects including manpower optimization studies, business model innovation, organization design, and strategy formulation projects. Suhail is interested in strategy and operating model formulation, workforce modeling and analytics, process improvement.

Abdulelah Alrifi is currently a group leader in Saudi Aramco's Organization Consulting Department where he leads a group of industrial engineers to conduct workforce optimization studies across the company. Abdulelah has more than 5 years of professional experience, mainly focused on manpower sizing and organizational design. He also worked as a maintenance engineer in Ras Tanura Refinery for one year. Abdulelah received his BS in Industrial

Engineering with distinction from Purdue University in 2013 and will be further pursuing his MBA in 2019. Abdulelah is interested in business analytics, manpower modeling, statistics, and process improvement.