

Proceedings of the 6th Annual World Conference  
of the Society for Industrial and Systems Engineering,  
Herndon, VA, USA  
October 19-20, 2017

## Job Shop Resilience

**M Alquraish, SY Alghamdi, and KK Krishnan**

Department of Industrial and Manufacturing Engineering  
Wichita State University  
Wichita, KS 67260, USA

Corresponding author's Email: [krishna.krishnan@wichita.edu](mailto:krishna.krishnan@wichita.edu)

**Abstract:** Resilience in relation to the maintenance and management of job shop systems has not yet received significant consideration or adequate study. Yet resilience is increasing in usage within engineering fields, although its application varies from one system to another. The matrices for resilience depend on the structure of the system and the failure factors. Machine stability is significant to the industry because of the need to build quality and to minimize production loss resulting from machine breakdown. A disruptive event on the machine leads to full loss of production in the job shop. In order to mitigate the impact of machine break down, it is essential to pinpoint a new resilience definition, measurements, and a new model design and evaluate the resilience using analysis tools. In a job shop, machines are considered most important, and they are always the most susceptible to disruptions during different kinds of operations. A disruptive event in a machine causes errors in the machine workload, operations dynamic, and the job shop system. This paper proposes a new definition for resilience in a job shop and analysis frameworks. The report includes the resilience curve, quantification, and measurement technique

*Keywords:* Resilience, Job Shop, Machine Breakdown