

## Department of Systems Engineering and Engineering Management

### Seminar Series

# **Sometimes, a Black Swan Ain't So Black: Three analytical observations motivating the need for careful government regulation of safety-critical protective systems**

**Prof. Martin A. Wortman**

Professor

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Date	28 May 2018 (Monday)
Time	10:00am - 11:30am
Venue	P7510, 7/F, Yeung Kin Man Academic Building

### **Abstract**

Engineers understand that technology-based catastrophes are a consequence of the failure (in either design or operation) of sophisticated protective systems that overlay safety-critical enterprises. Recent high profile catastrophic failures (the Macondo Blowout, the Fukushima Incident, the Lac-Magantic Rail Explosion, and other black swan accidents) have focused public concern and sparked considerable political debate. Yet, for the past two decades government regulation of safety-critical enterprises has been increasingly under attack from both legislators and business interests. While general regulatory reform is certainly needed, regulation of safety-critical protective systems serves an essential function in ensuring public welfare. This is especially true with certain emergent technologies in the commercial energy and chemical/biologic processing sectors, where production capacity can be incrementally expanded through the deployment of production modules. Beginning with a brief introduction to moral hazard induced by information asymmetry, we give three simple analytical arguments that help to explain need for re-thinking how safety-critical protective systems are engineered and regulated. From here, we make the case that regulatory engineering presents special challenges for professional education that are not presently being addressed.

## About the Speaker

**Wortman** has a longstanding interest in reliability and risk. As a teenager growing up in North Carolina, he destroyed bicycles, shop tools, water skis, power mowers, numerous football helmets, and a 1966 Plymouth. Recognizing that his lifestyle was becoming both dangerous and prohibitively expensive, he began emphasizing a more analytical (and thus less empirical) approach to reliability and risk. He has worked in computational probability for more than 30 years, is past Editor-in-Chief of the IEEE Transactions on Reliability, and is a Professor at Texas A&M University where he leads a comparatively safe existence.

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