



SYSTEM SAFETY COMES OF AGE IN INDUSTRY 4.0

Sonia Bot & Tony Zenga

“Industry 4.0” the “Fourth Industrial Revolution”

What exactly is it?

**More important, what
does it mean for
railroads?**

- ❖ **How do we know that these solutions and systems are safe and that there are no lurking issues?**
- ❖ **How do we know that the integration of multiple components from vendors, partners, and even from within meet safety objectives?**
- ❖ **How do we know if safety integrity is preserved after a change is made?**
- ❖ **How do we shift the paradigm where safety moves from a cost center to a value-added business driver?**

**The railroad “mantra” has always been “Safety First”,
and the industry’s safety statistics,
as measured by FRA and Transport Canada,
have been continuously improving
for at least a generation.**

**Yet, you stress that “system safety as a formal practice”
is in the very early development stages in the rail industry,
indeed, across the transportation supply chain.**

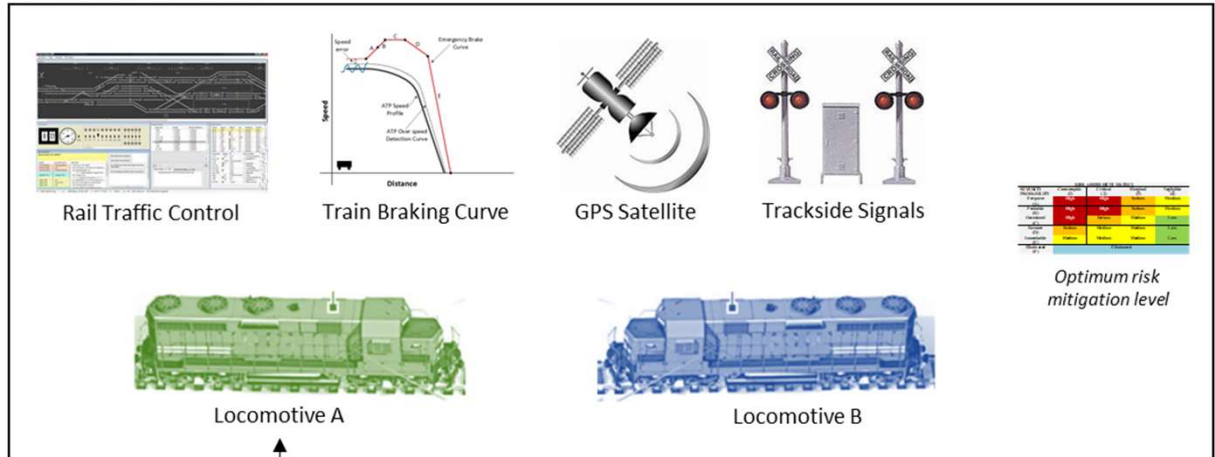
**What differentiates Safety First from System Safety?
(i.e. What is System Safety?)**

What is the Systems of Systems level?

It sounds kind of complex, almost daunting.

Is it simpler than it sounds?

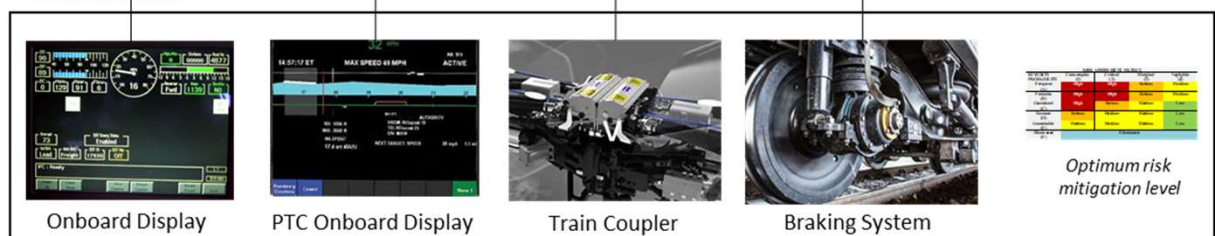
SYSTEM OF SYSTEMS



SYSTEM



SUBSYSTEM

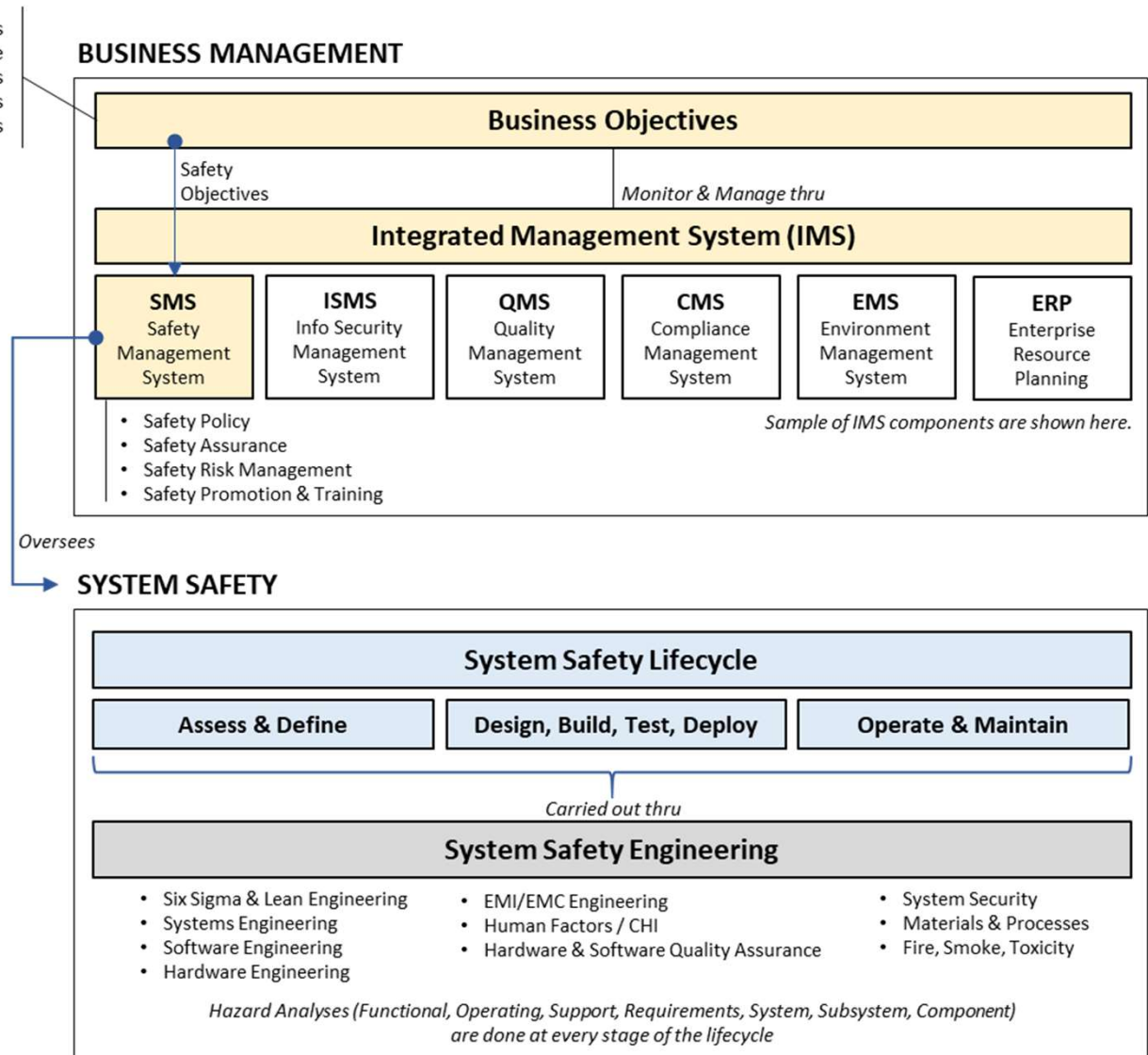


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Describe the holistic view of safety.

If it's a universal business concept, how does it apply specifically to a railroad?

- Regulatory Requirements
- Competitive Landscape
 - Customer Needs
 - Market Forces
 - Business Goals



**Given the rapid pace of technological innovation
in the rail industry,
you believe that system safety
“needs more support in business plans”,
as reactive fixes to safety problems
won’t work anymore.**

How is this accomplished?



FOR MORE INFORMATION

SPECIFIC TO THIS PRESENTATION

Bot, Sonia D. and Tony Zenga. 2020. Safety Doesn't Happen by Accident: System Safety Comes of Age, PART 1: The Case for System Safety. *Railway Age*. September/October 2020.

PDF: [Railway Age October 2020 System Safety Part I-BotZenga](#)

Link: <https://www.railwayage.com/safety/safety-doesnt-happen-by-accident-system-safety-comes-of-age/#>

Bot, Sonia D., Tony Zenga, William C. Vantuono (editor). 2020. Safety Doesn't Happen by Accident: System Safety Comes of Age, PART 1: The Case for System Safety. *Rail Group On Air (Railway Age; Rail, Tracks, and Structures; International Railway Journal)*. Podcast. October 2020.

PODCAST: <https://www.railwayage.com/podcasts/safety-doesnt-happen-by-accident-part-1-rail-group-on-air-podcast/>

TRANSCRIPT: [TRANSCRIPT-RailwayAge-SystemSafety-Podcast1-2020-10-10](#)

OTHER RELATED REFERENCE MATERIAL

<https://botgroupinc.com/publications/>

**3-PART SERIES BY SONIA BOT & TONY ZENGA
HOSTED BY ISSS CANADA**

SYSTEM SAFETY COMES OF AGE IN INDUSTRY 4.0

May 26, 2021

SYSTEM SAFETY AS A VALUE-ADDED BUSINESS DRIVER

June 9, 2021

SYSTEM SAFETY: OVERLOOKED PRACTICES

July 7, 2021

SONIA BOT, chief executive of The BOT Consulting Group Inc., has played key roles in the inception and delivery of several strategic businesses and transformations worldwide. She's navigated through downsizing, right-sizing, de-regulations, SEC investigations, and economic downturns / scale-ups, let alone work through one of the largest and high-profile global corporate bankruptcies in the world.

By utilizing methodologies in entrepreneurship, business precision, Lean Six Sigma, systems and process engineering, and organizational behavior she's enabled organizations to deliver breakthrough results along with providing them a foundation to continue to excel. Her approaches on the evolution of companies and industries are game changers that drive innovation and competitive advantage.

Her experience ranges from Fortune 500 corporations through to medium-sized ones, plus SMBs and start-ups. Industries include high technology, media, telecommunications, information and computing technology, railroading, transportation, energy, medical and healthcare, aerospace and defense, and education.

She holds engineering degrees from the University of Waterloo (BMath) and the University of Toronto (MAsc) and is a certified Lean Six Sigma Master Black Belt.

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TONY ZENGA is the ISSS Canada Chapter President and owner of CMTIGroup Inc. Tony is an accomplished specialty engineering consultant with international experience in operational reliability and safety for mission critical systems. He has played key roles in the implementation of System Safety engineering programs for aerospace, defense, high tech, air traffic control, mass transit and rail infrastructure projects worldwide.

By leveraging on his design and development experience of largescale safety-critical systems, combined with his systems engineering knowledge, he enables organizations to deploy their systems safely into field operation.

Tony was awarded the ISSS Manager of the Year Award in November 2020. He holds a Bsc, Engineering degree from California Coast University and is a certified software engineer from University of British Columbia.

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