

Assessing Survivability of Cyber-Physical Systems

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What is Survivability?



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survivability: A property of a system, subsystem, equipment, process, or procedure that provides a defined degree of assurance that the named entity will continue to function during and after a natural or man-made disturbance; e.g., nuclear burst. (188) Note: For a given application, survivability must be qualified by specifying the range of conditions over which the entity will survive, the minimum acceptable level or post-disturbance functionality, and the maximum acceptable outage duration.

Federal Standard 1037C
Telecommunications: Glossary
of Telecommunication Terms
Date of Publication: August 7,
1996

Is this a Cyber-Physical System?

Cyber-physical systems (CPS) are systems with interacting computational components and physical systems



File:SAR Class 19D No.
2685 - Wesley - Umgeni
Steam Railway.jpg

Bruce D. Benett
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Is this a Cyber-Physical System?

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What about these?



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"Vincent de Groot - <http://www.videgro.net>, License CC-BY-SA

What are we after?

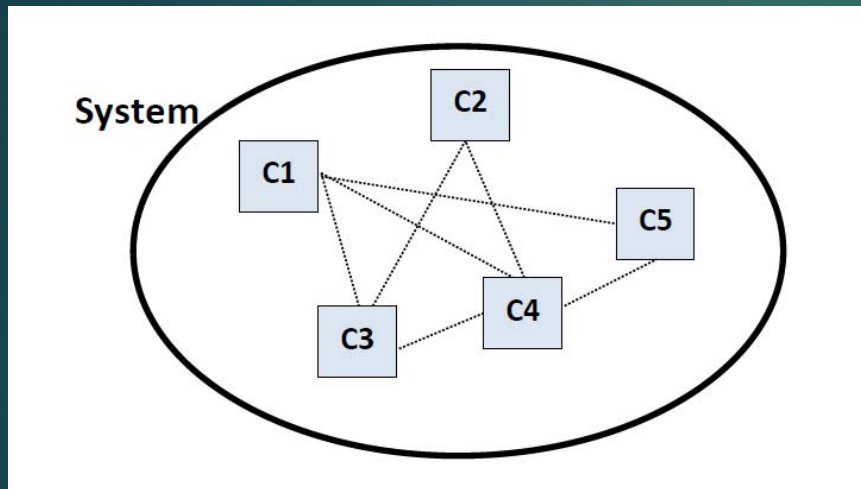


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...a degree of assurance that the named entity will continue to function during and after a natural or man-made disturbance...

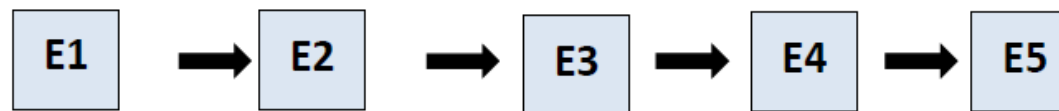
Almost every physical security system is a cyber-physical system.

Thinking about systems and security



For want of a nail the shoe was lost.
For want of a shoe the horse was lost.
For want of a horse the rider was lost.
For want of a rider the battle was lost.
For want of a battle the kingdom was lost.
And all for the want of a horseshoe nail.
Anonymous

Chain of Events



Figures from "STPA Handbook" pg 5 by Nancy Leveson and John Thomas in accordance with the stated Copyright.

A quick contrast with IT systems



<https://commons.wikimedia.org/wiki/File:S7300.JPG>

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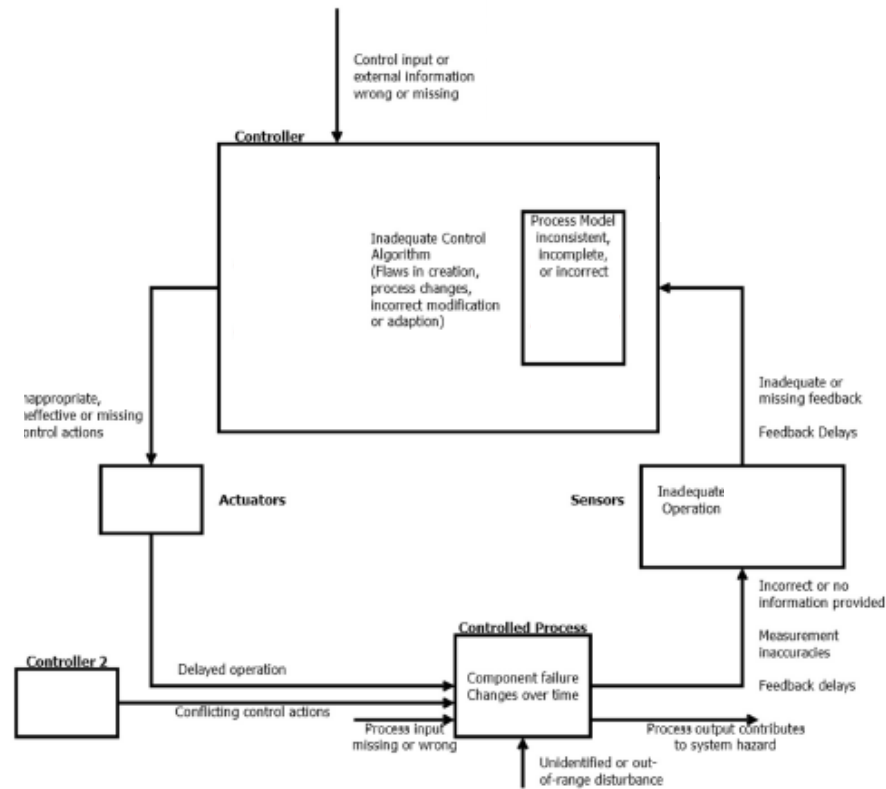
How do we “continue to function?”



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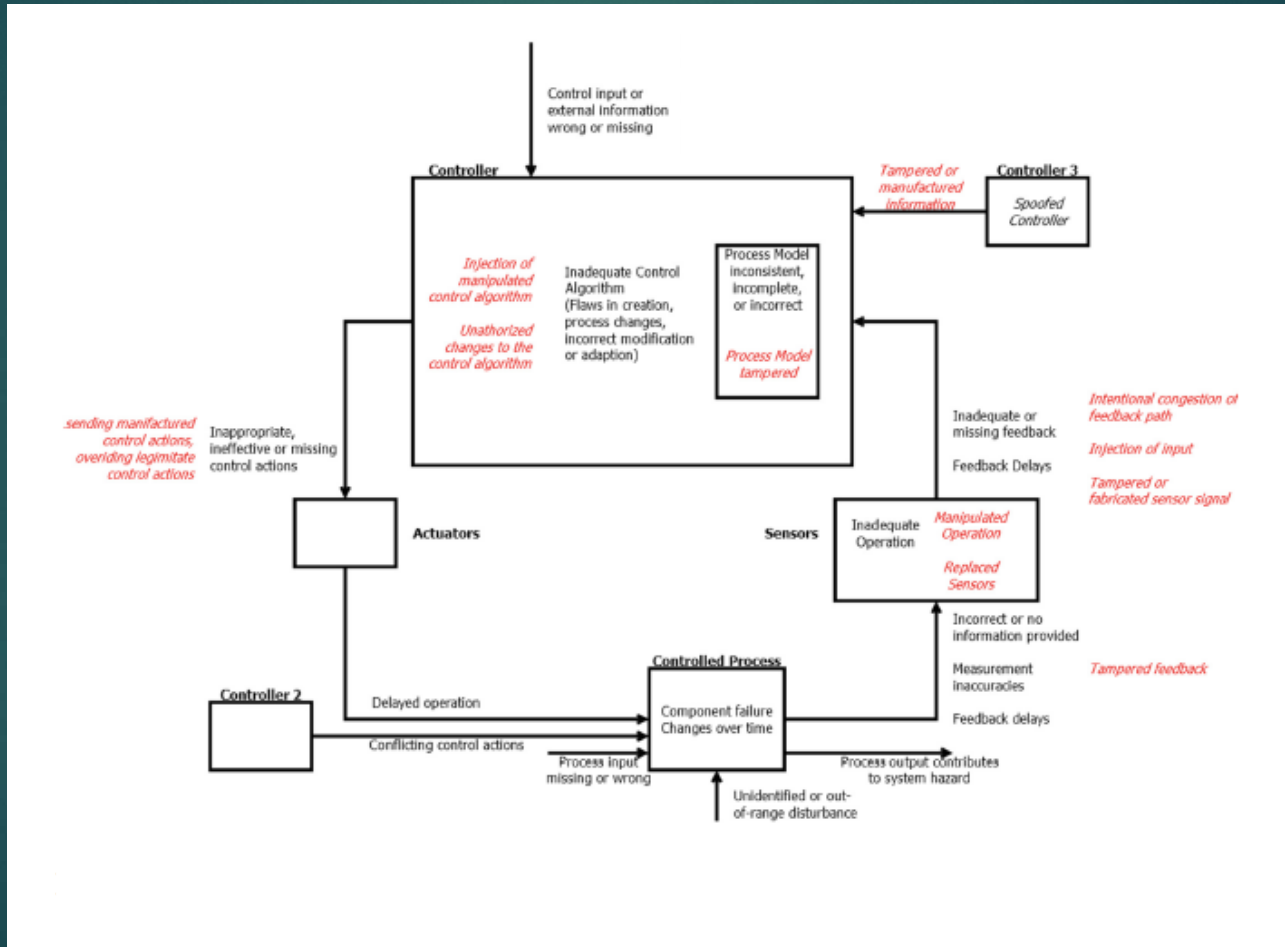
Applying this systems idea

From:
Limitation and
Improvement of
STPA-Sec for Safety and
Security Co-
analysis
Christoph
Schmittner1 (B)
, Zhendong
Ma, and Peter
Puschner –
Derived from
Leveson and
Thomas

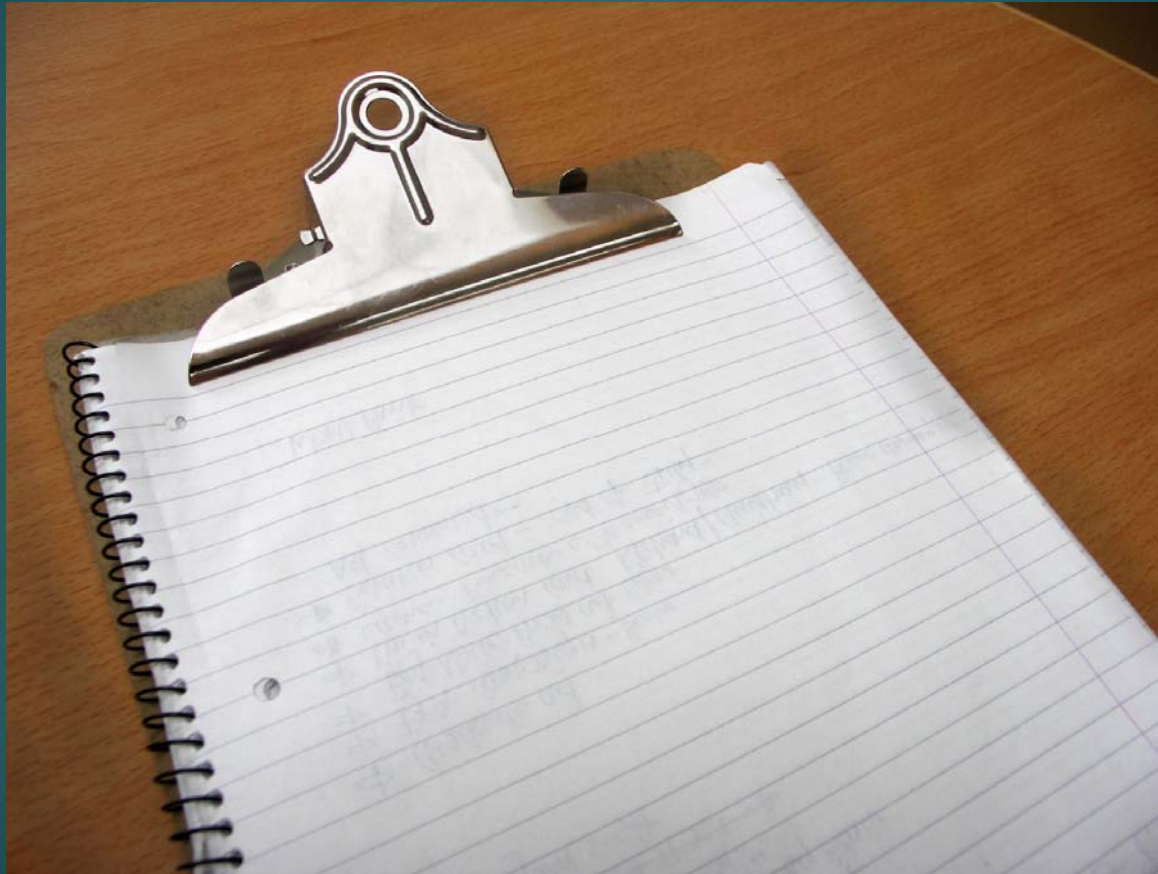


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Making the assessment



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Lunch time?



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