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Mental Models for Managing Grid Cybersecurity Risk

Track 2 – Cybersecurity and Energy Transition

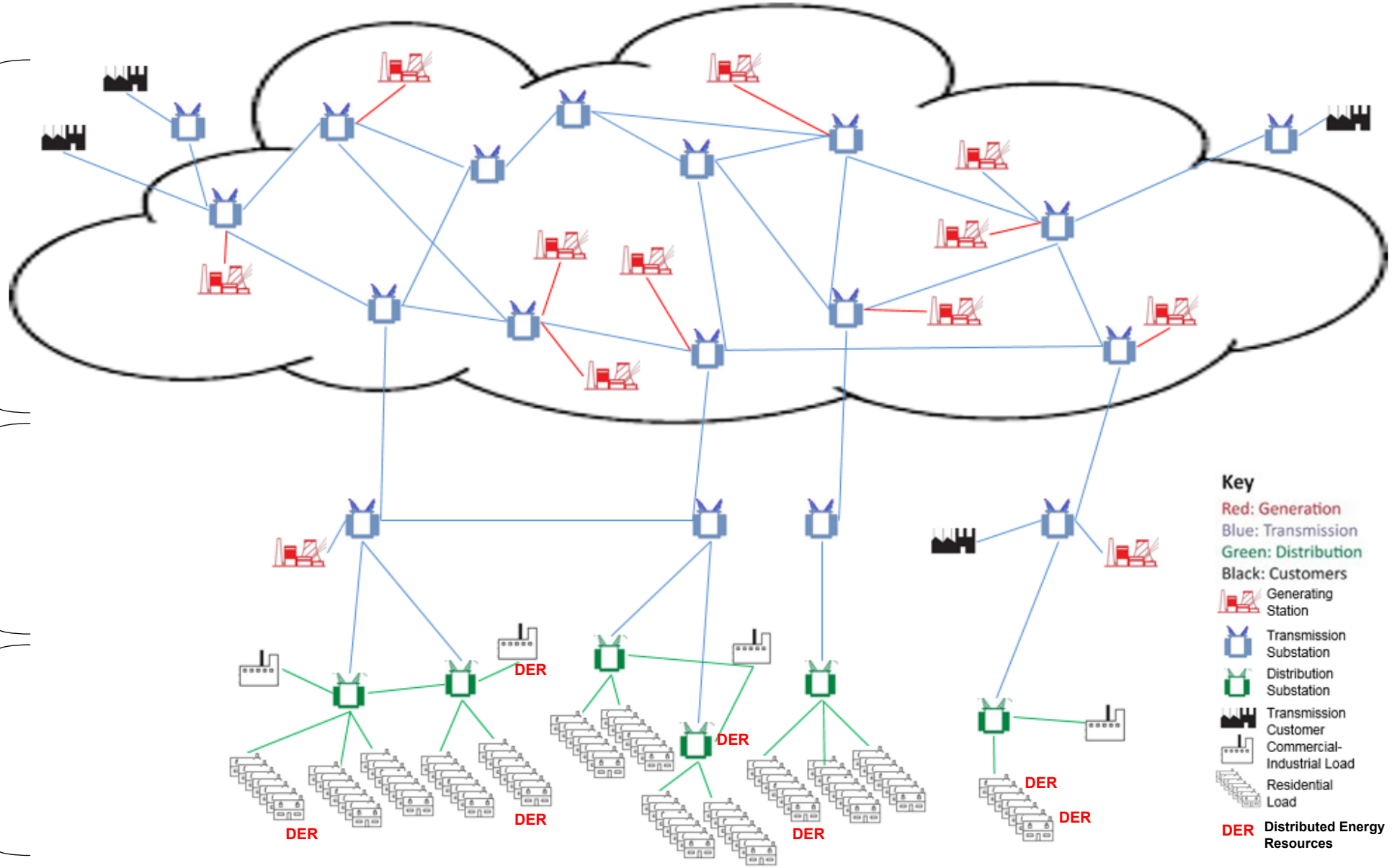
Idaho National Laboratory

The Grid

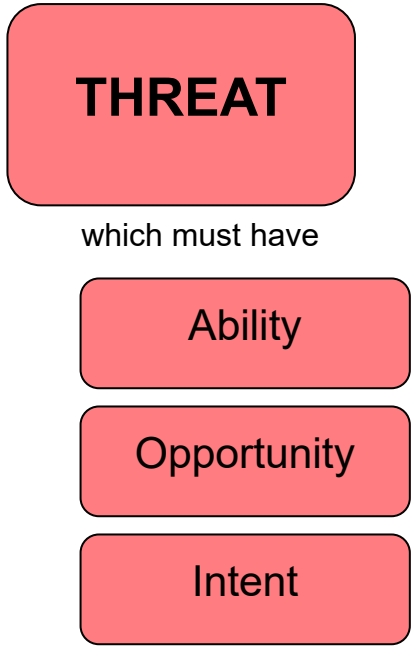
Bulk Electric System (BES): densely interconnected, highly reliable, redundant, NERC-regulated

Subtransmission: series-parallel paths from the BES to the lowest-voltage substations

Distribution: radially connected load and Distributed Energy Resources (DERs)



Disaggregating Risk



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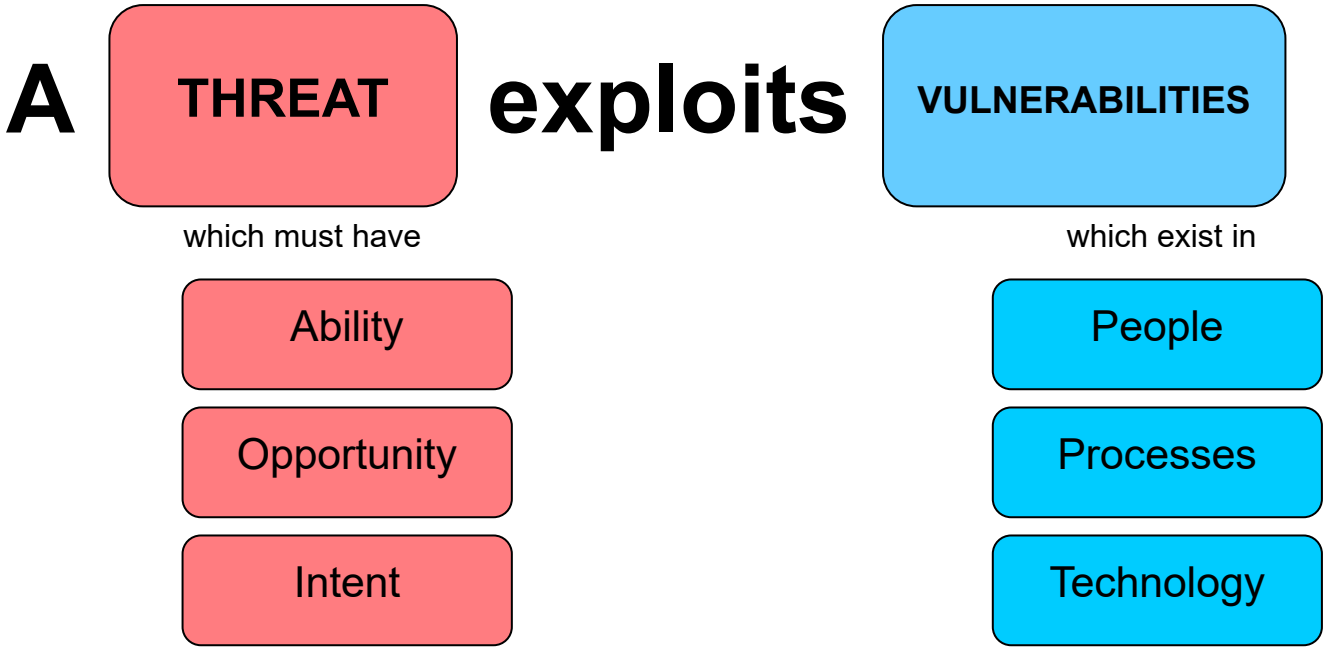

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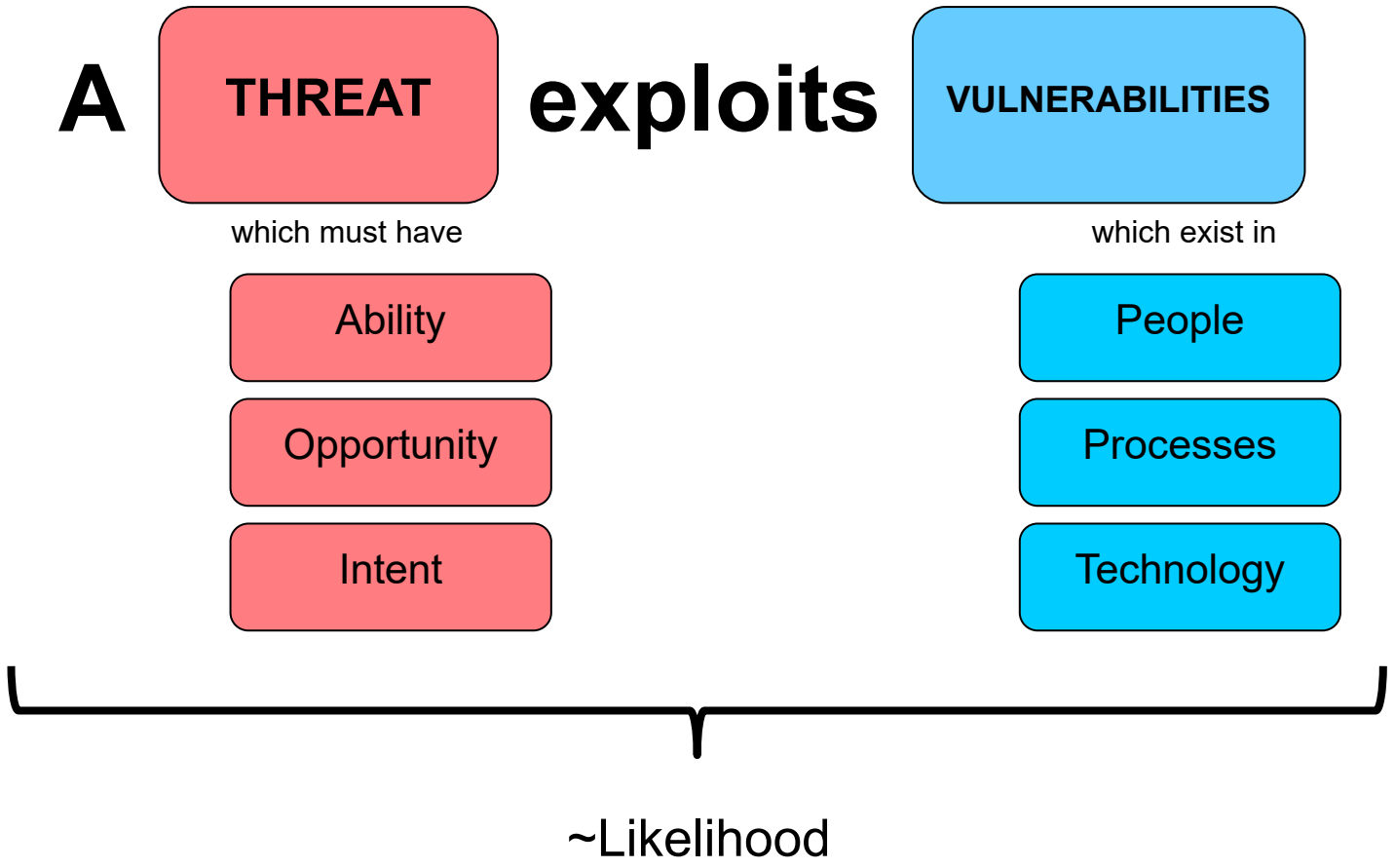

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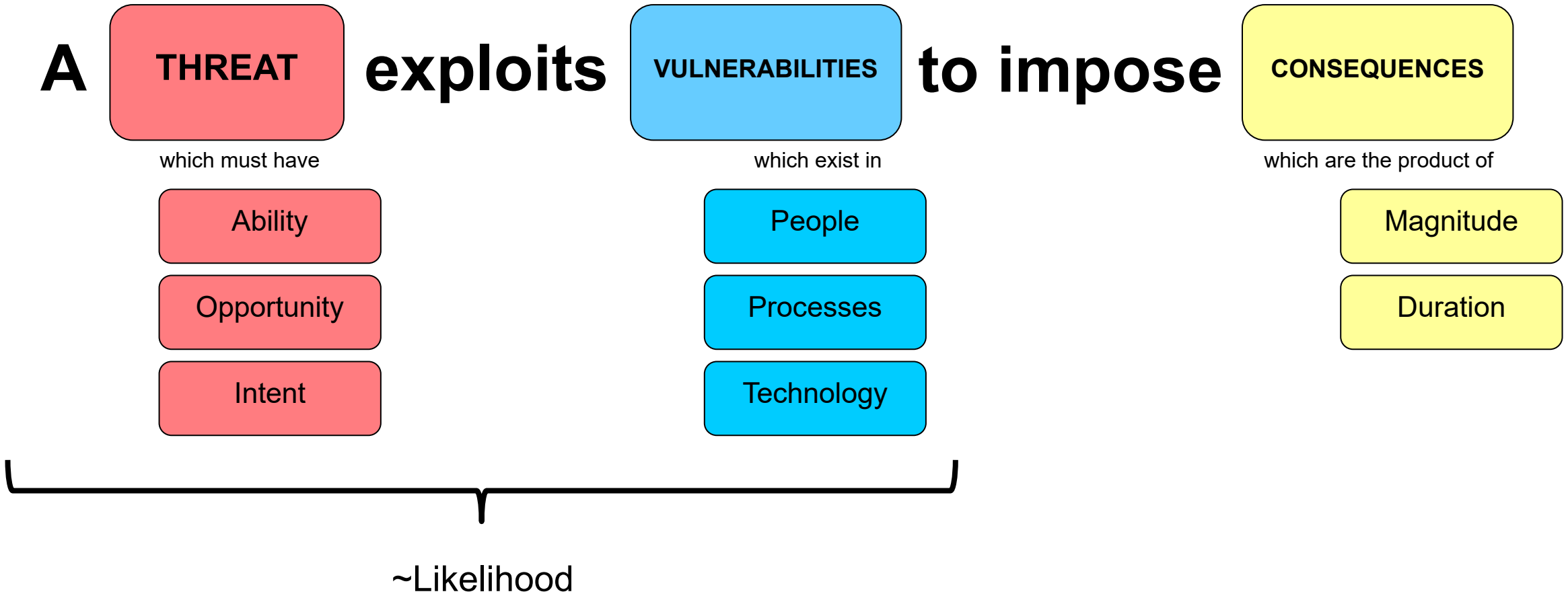
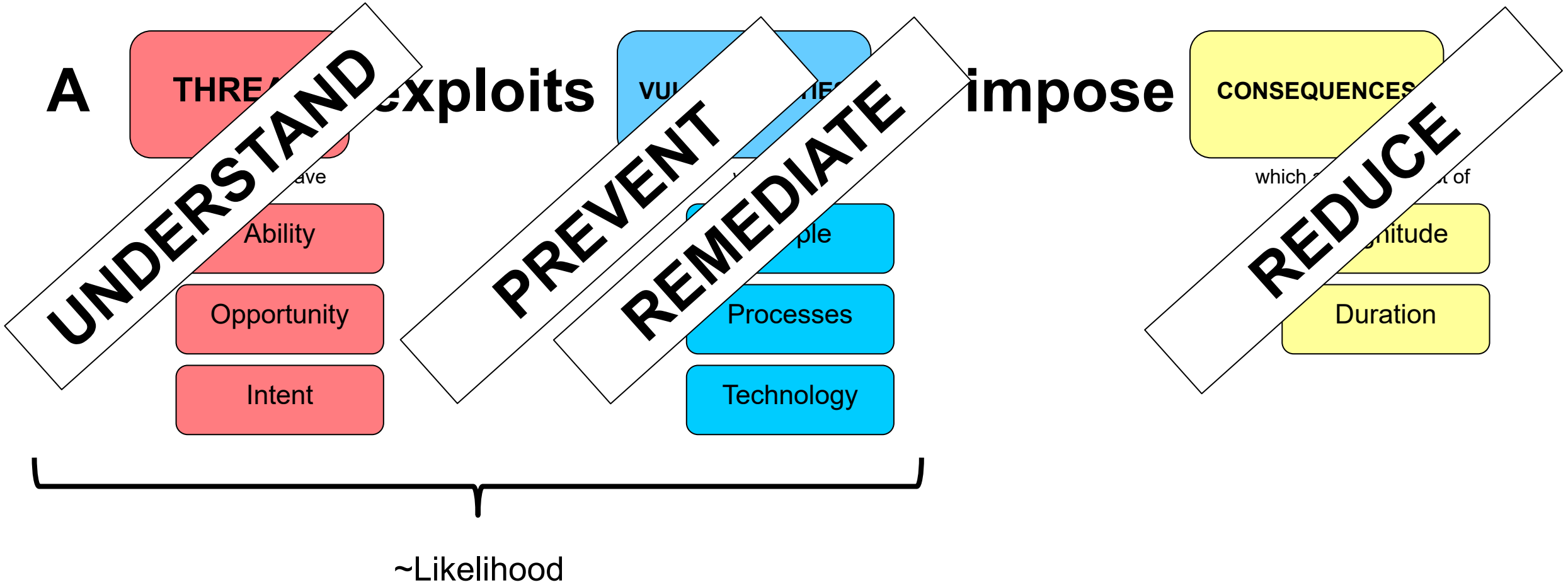
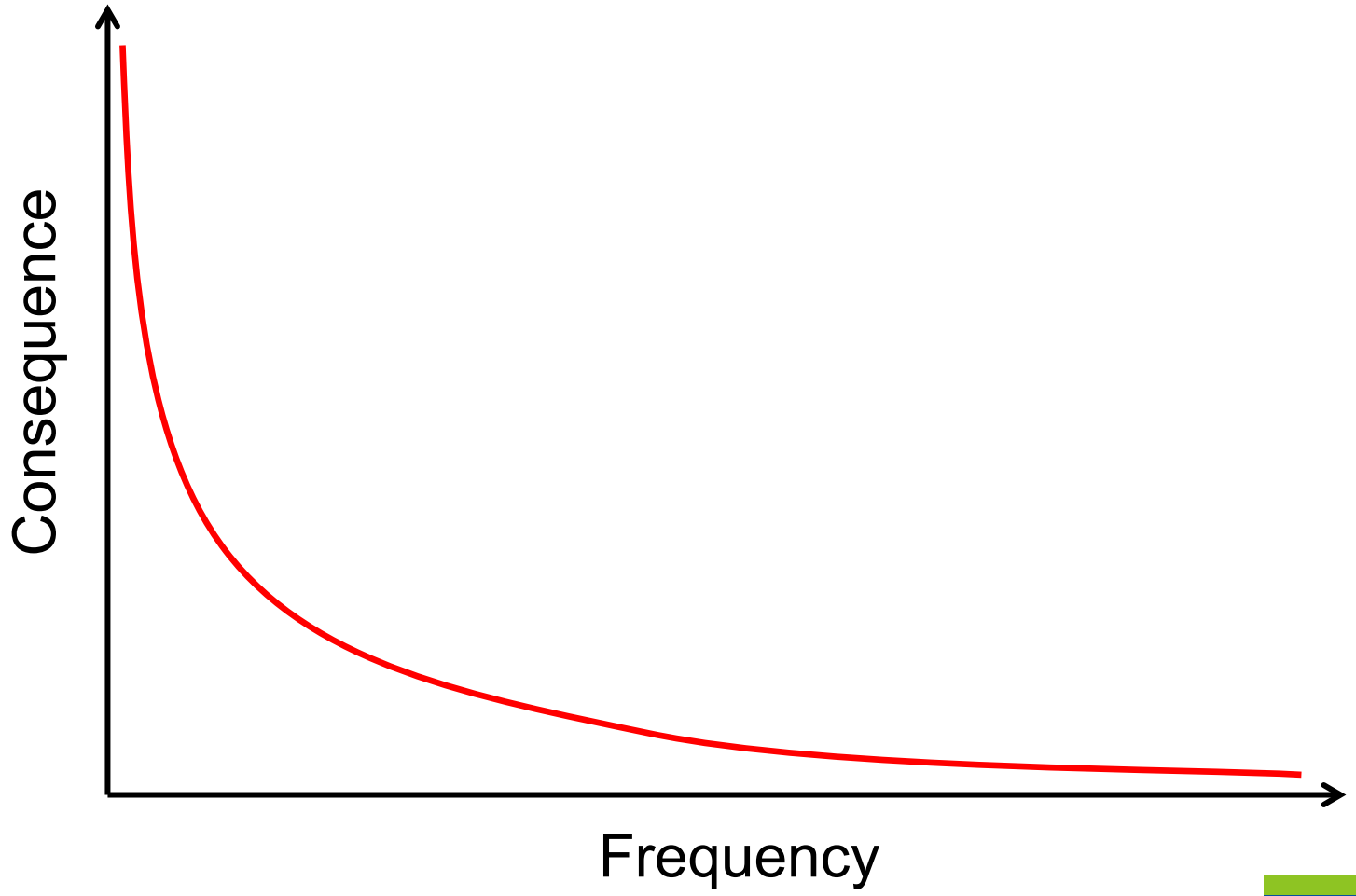


Risk Mitigation Tactics



The Character of Cyber Harms and Management Approaches



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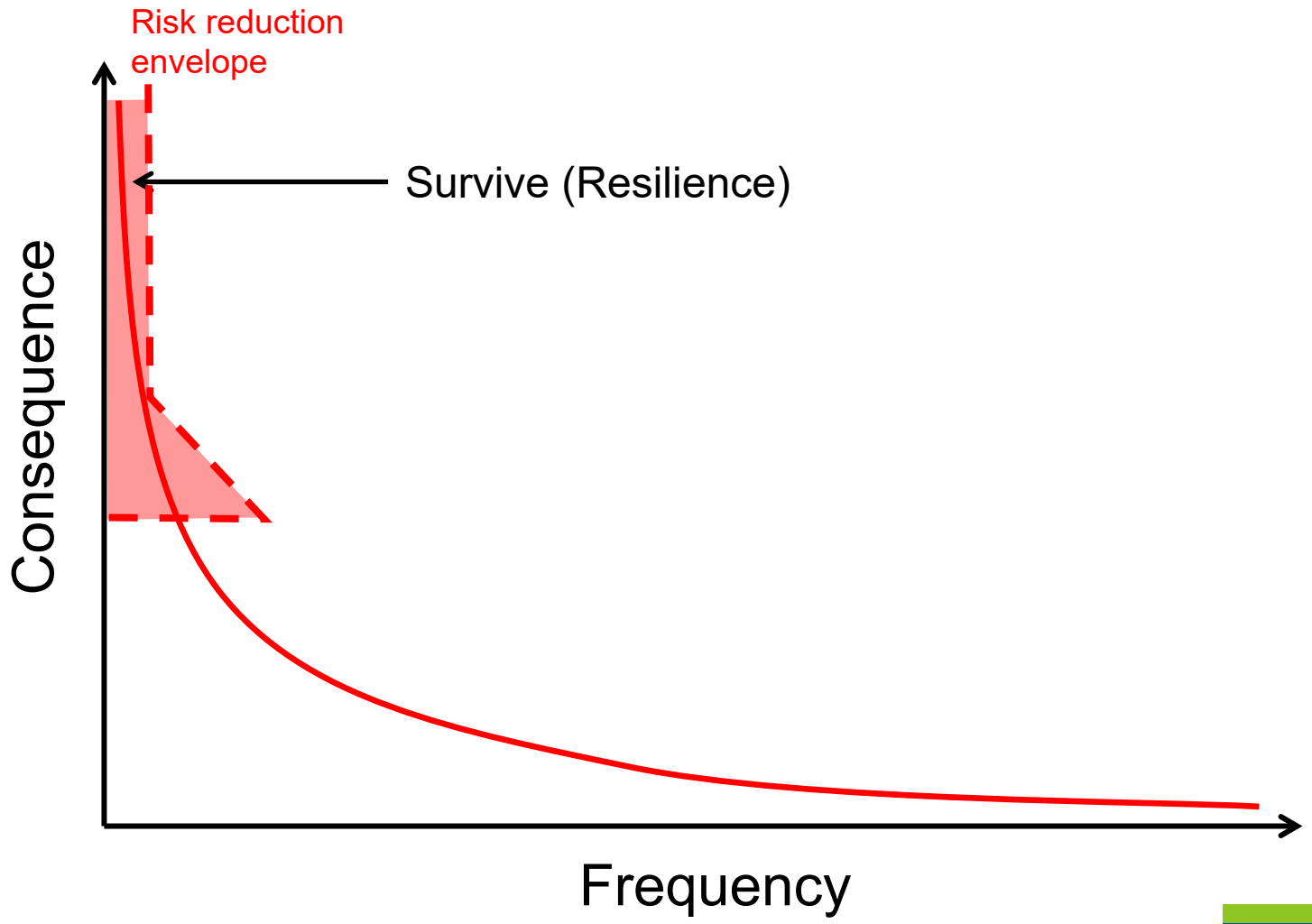

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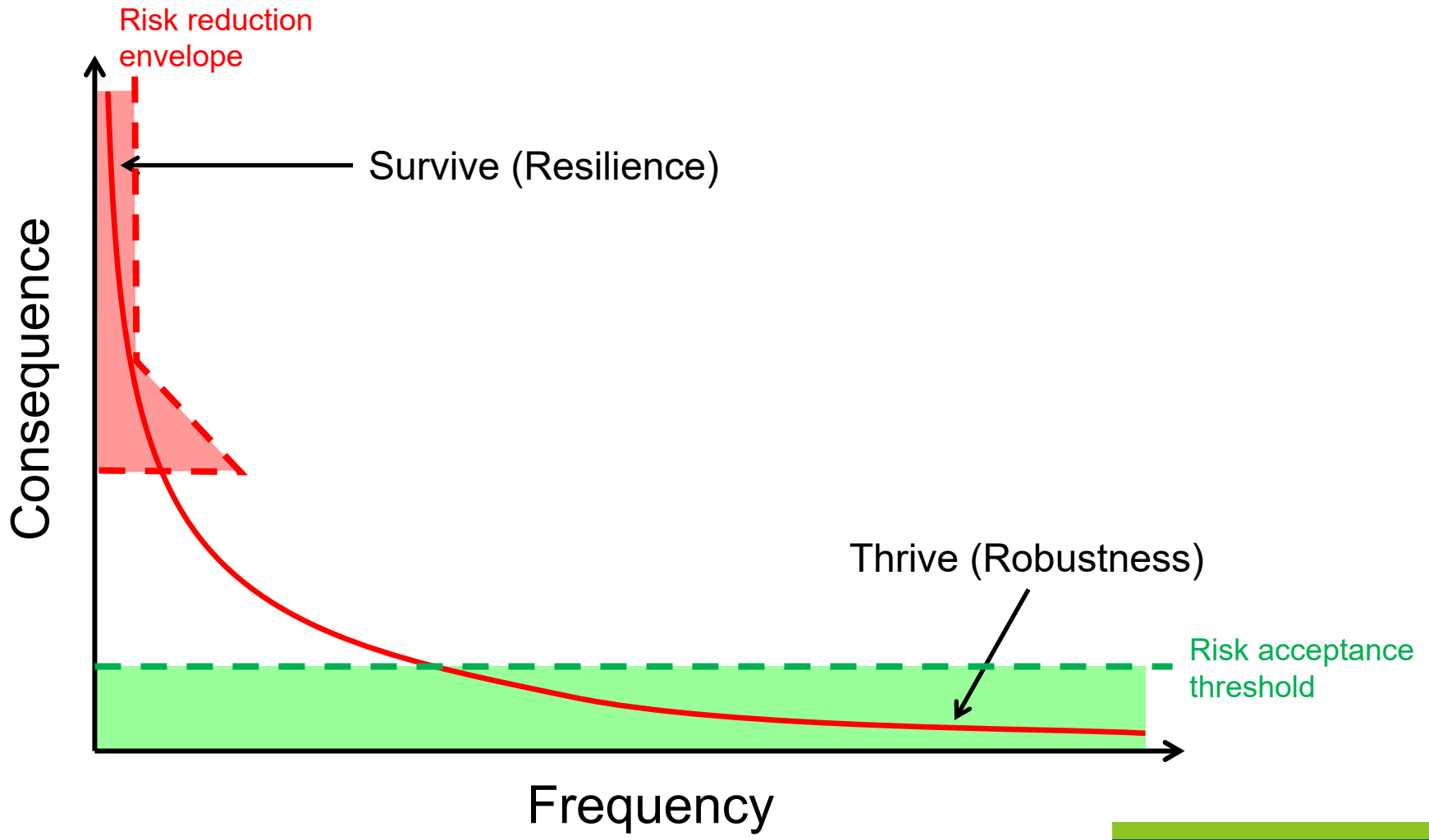

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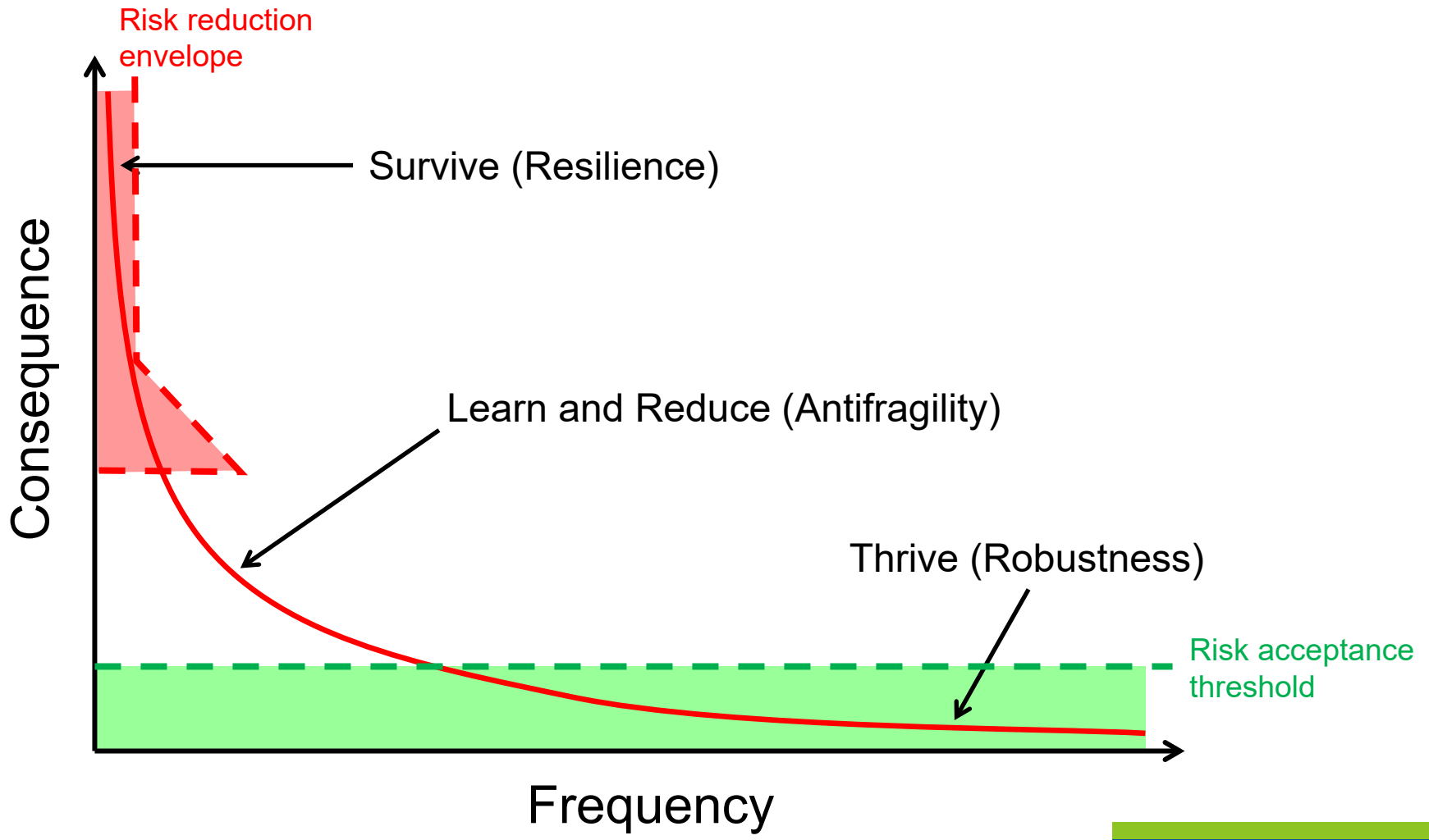
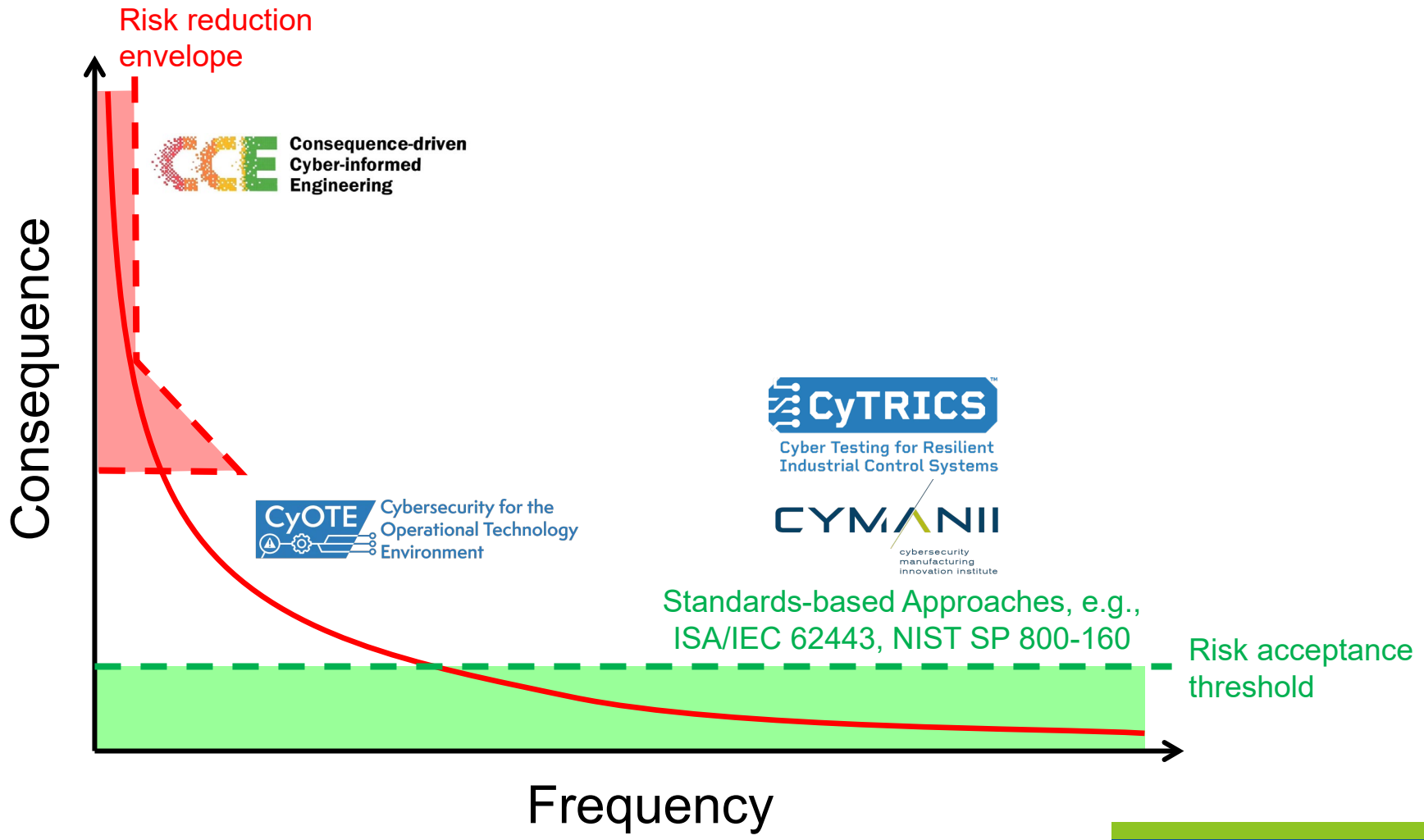


Programs to manage cyber risk



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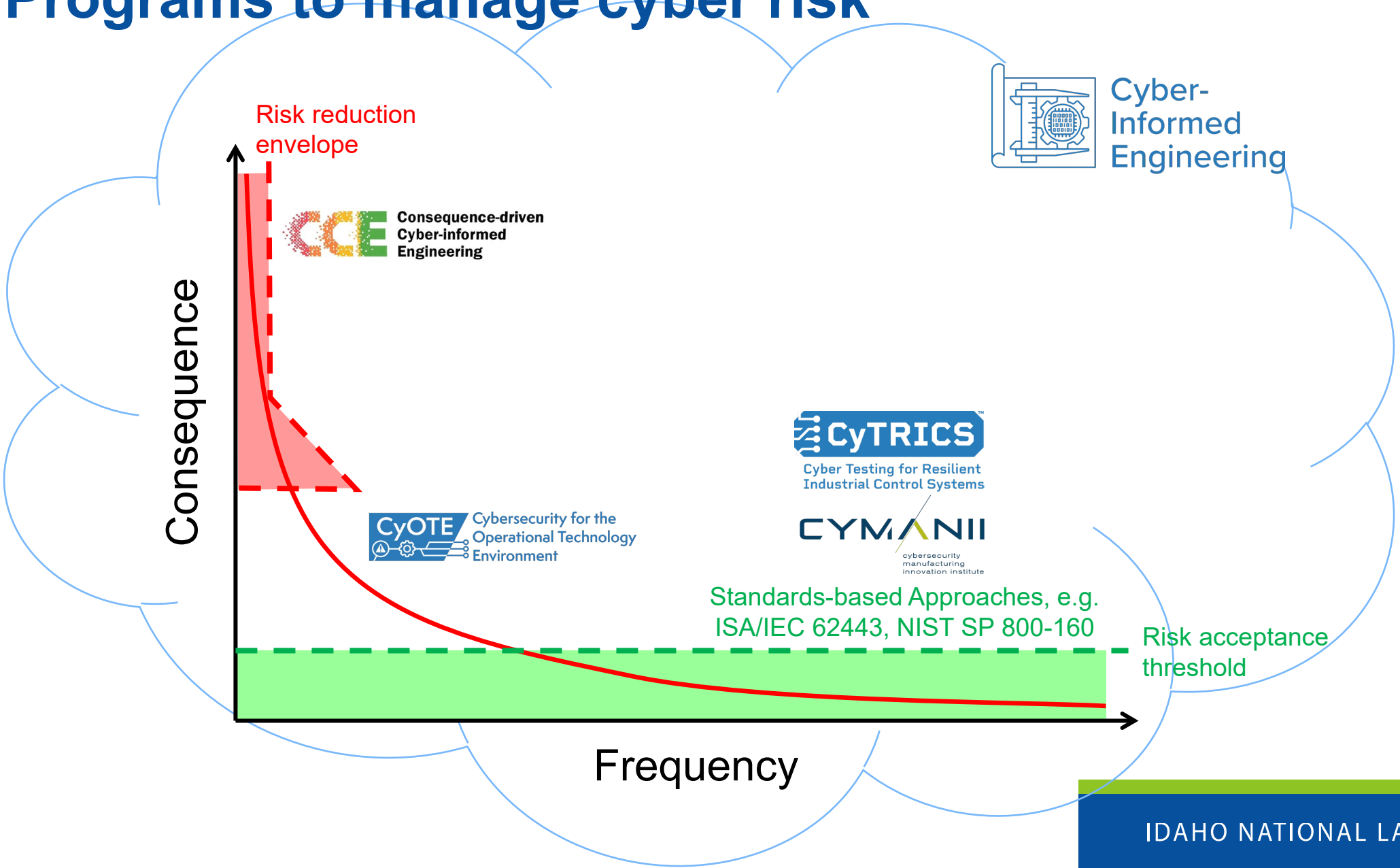
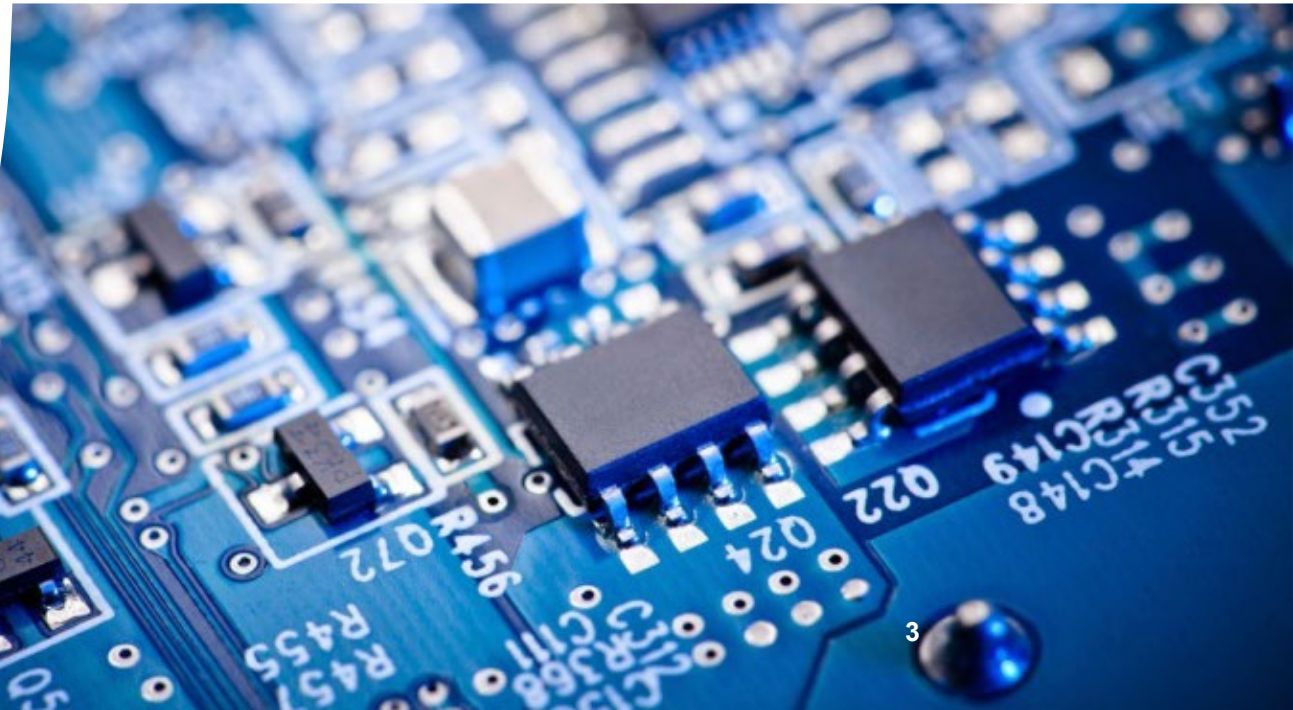


Principles of CIE

- Consequence-focused design
- Engineered Controls
- Secure information architecture
- Design Simplification
- Resilient layered defenses
- Active defense

- Interdependency evaluation
- Digital asset awareness
- Cyber-secure supply chain controls
- Planned resilience with no assumed security
- Engineering information control
- Security culture



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