

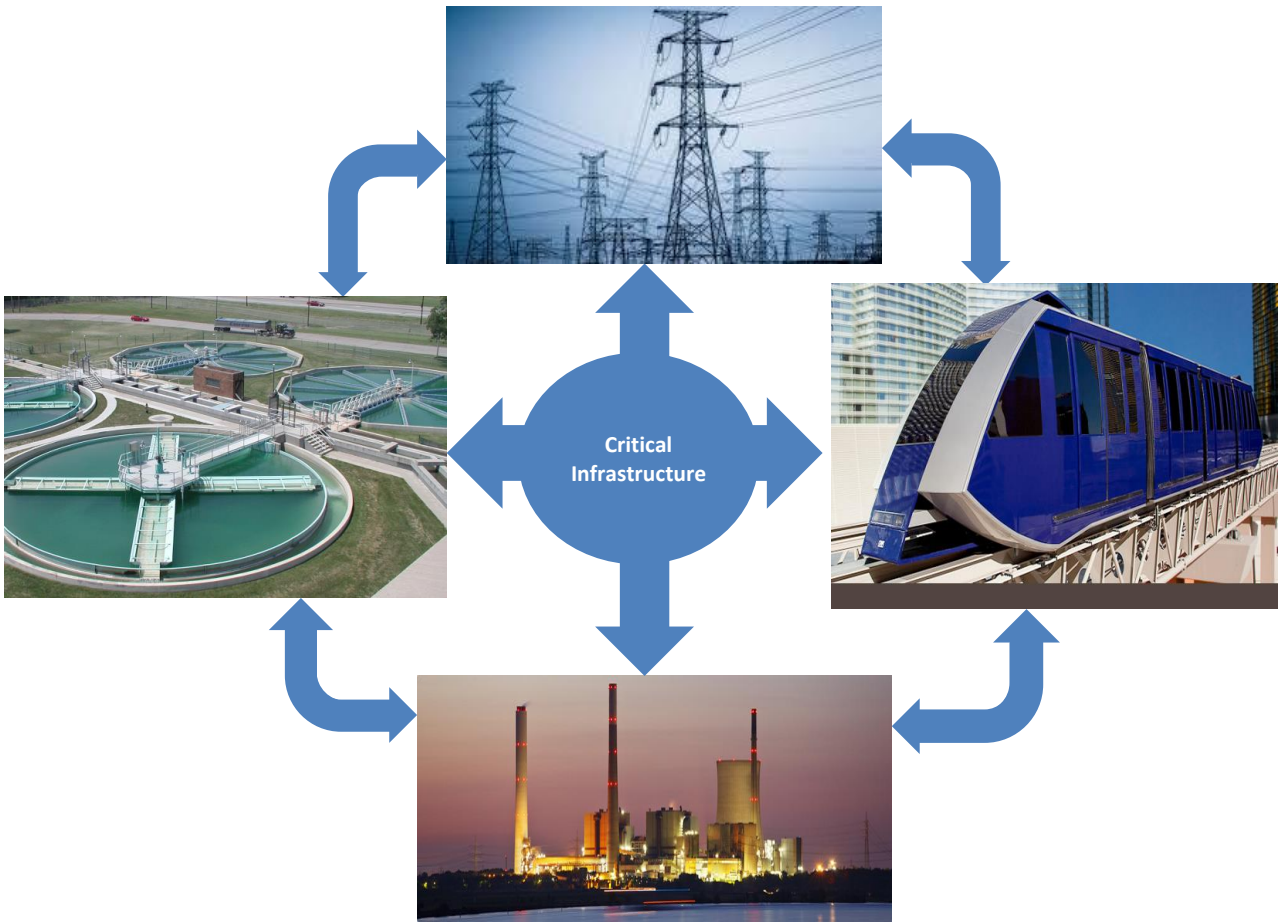
Physical Dimension of Critical Infrastructure And Risk

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Critical Infrastructure (CI) and Risk



Protection of Asset

Example of Used Methodologies

- Better infrastructure Risk and Resilience (BIRR)
- Protection of Critical Infrastructures (BMI)
- CARVER2
- etc.

Protection of Asset

Example of Used Methodologies

- Better infrastructure Risk and Resilience (BIRR)
- Protection of Critical Infrastructures (BMI)
- Critical Infrastructure Modelling Simulation (CIMS)
- etc.

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Protection of Asset

Limitations of Methodologies

- Limited Expertises
- Lack of Coherent Methodology
- Terminology
- Disciplinary Disconnection

Protection of Asset

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Coherent Framework




DG ENERGY Reference Security Management Plan

American Petroleum Institute





Coherent Framework

Goals

- Coherent Methodology 
- Flexible and Easy to use
- Common Terminology across all sector
- Common Matrices for Risk Assessment Calculation




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Coherent Framework





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- Coherent Methodology 
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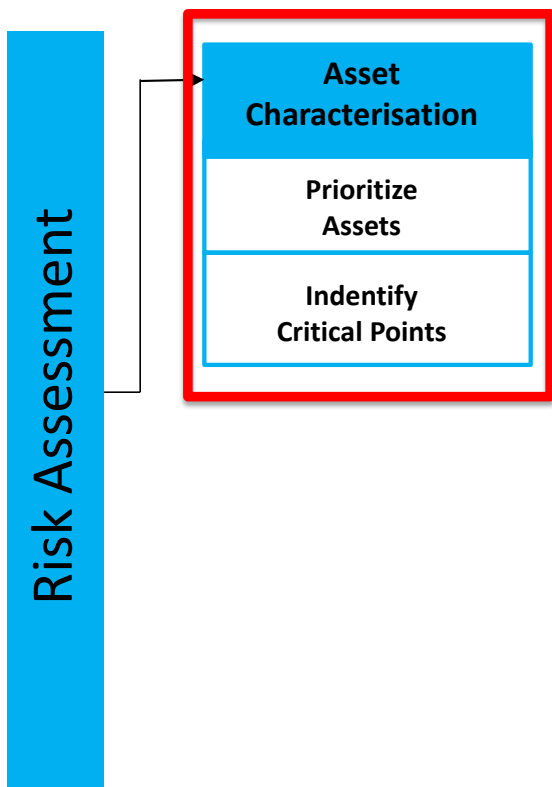
- Common Matrices for Risk Assessment Calculation

Coherent Framework

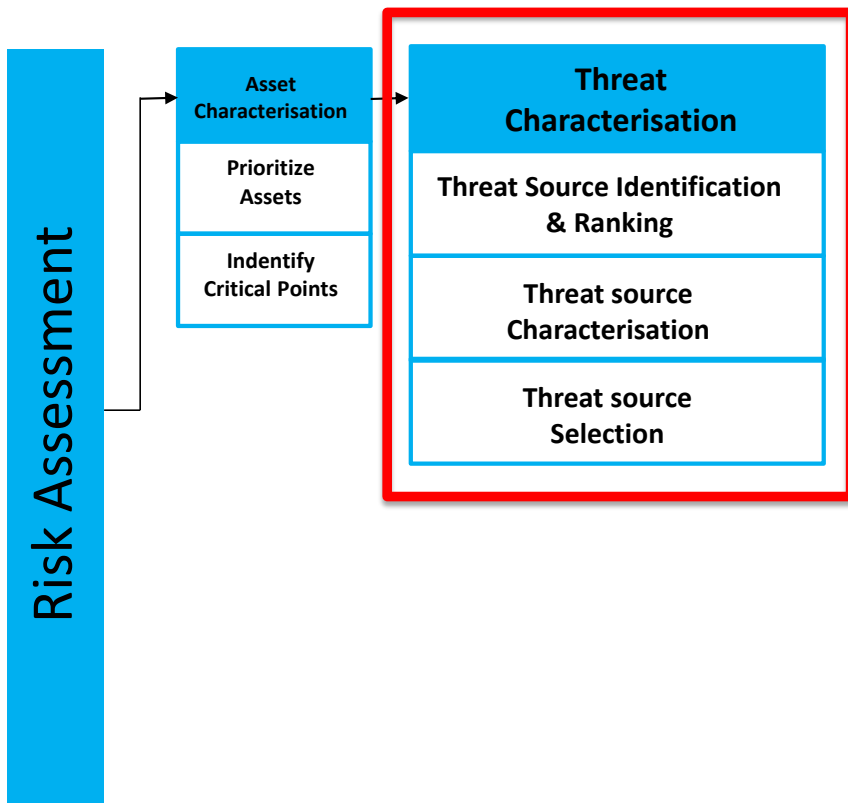
Goals

- Coherent Methodology 
- Flexible and Easy to use 
- Common Terminology across all sector 
- Common Metrics for Risk Assessment Calculation 

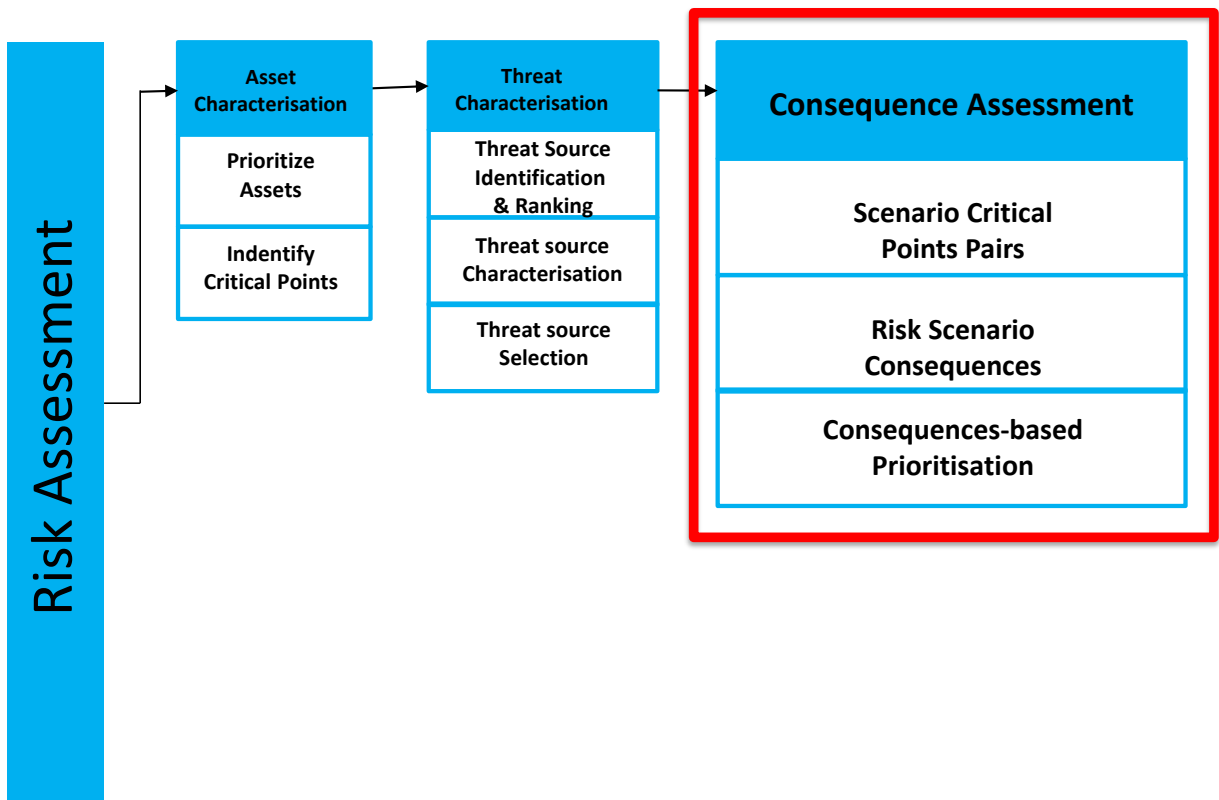
Example of Solution



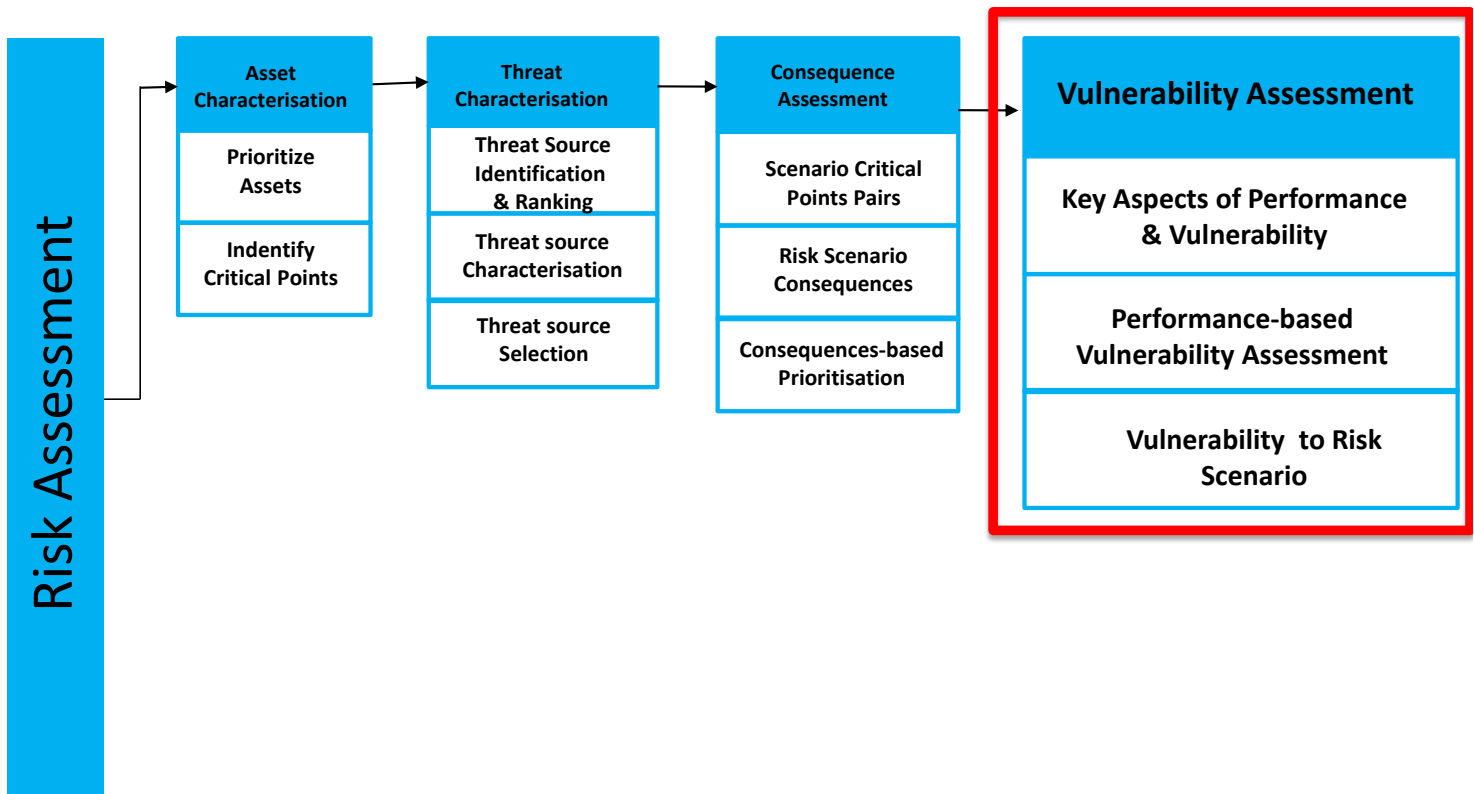
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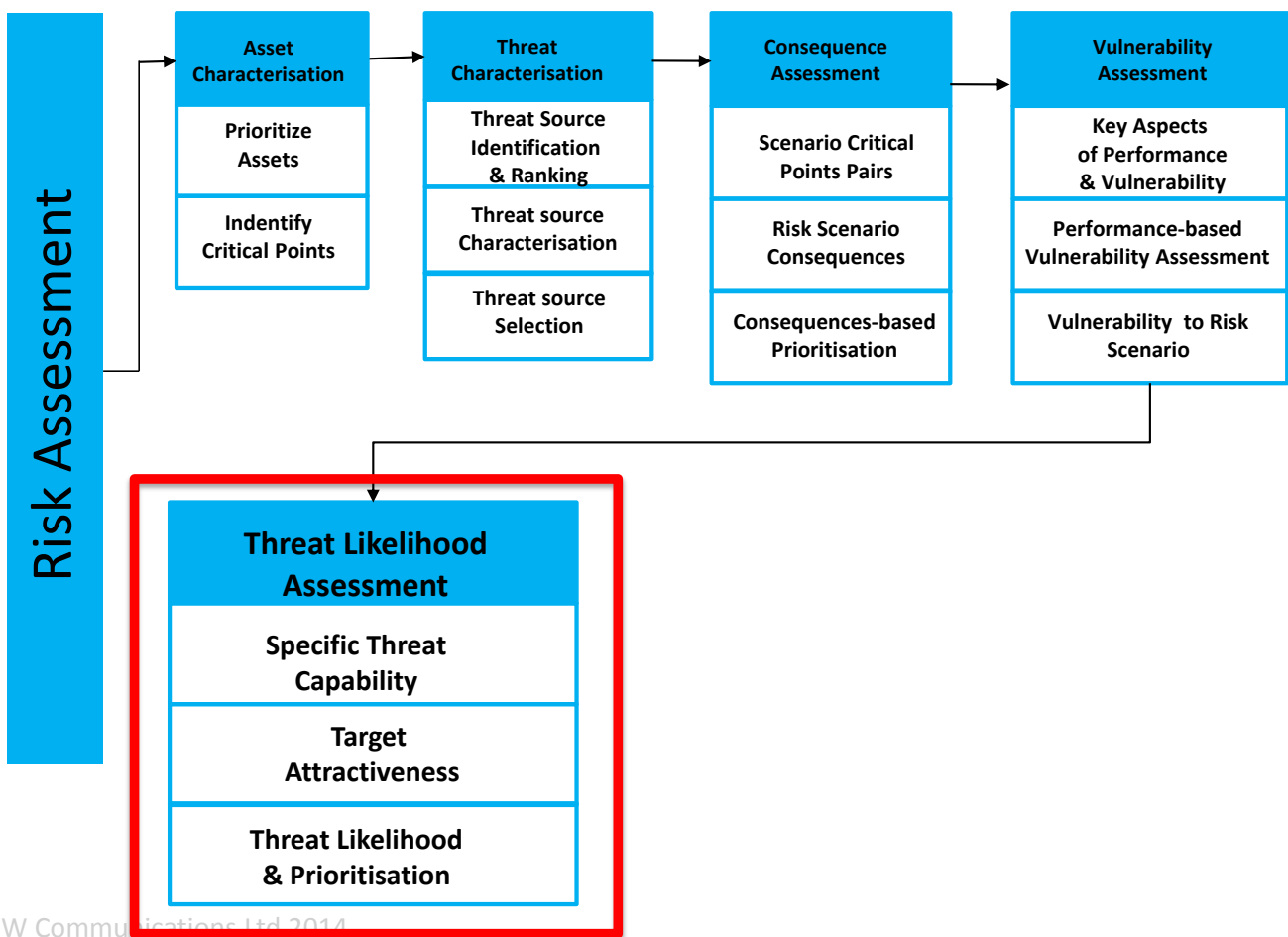
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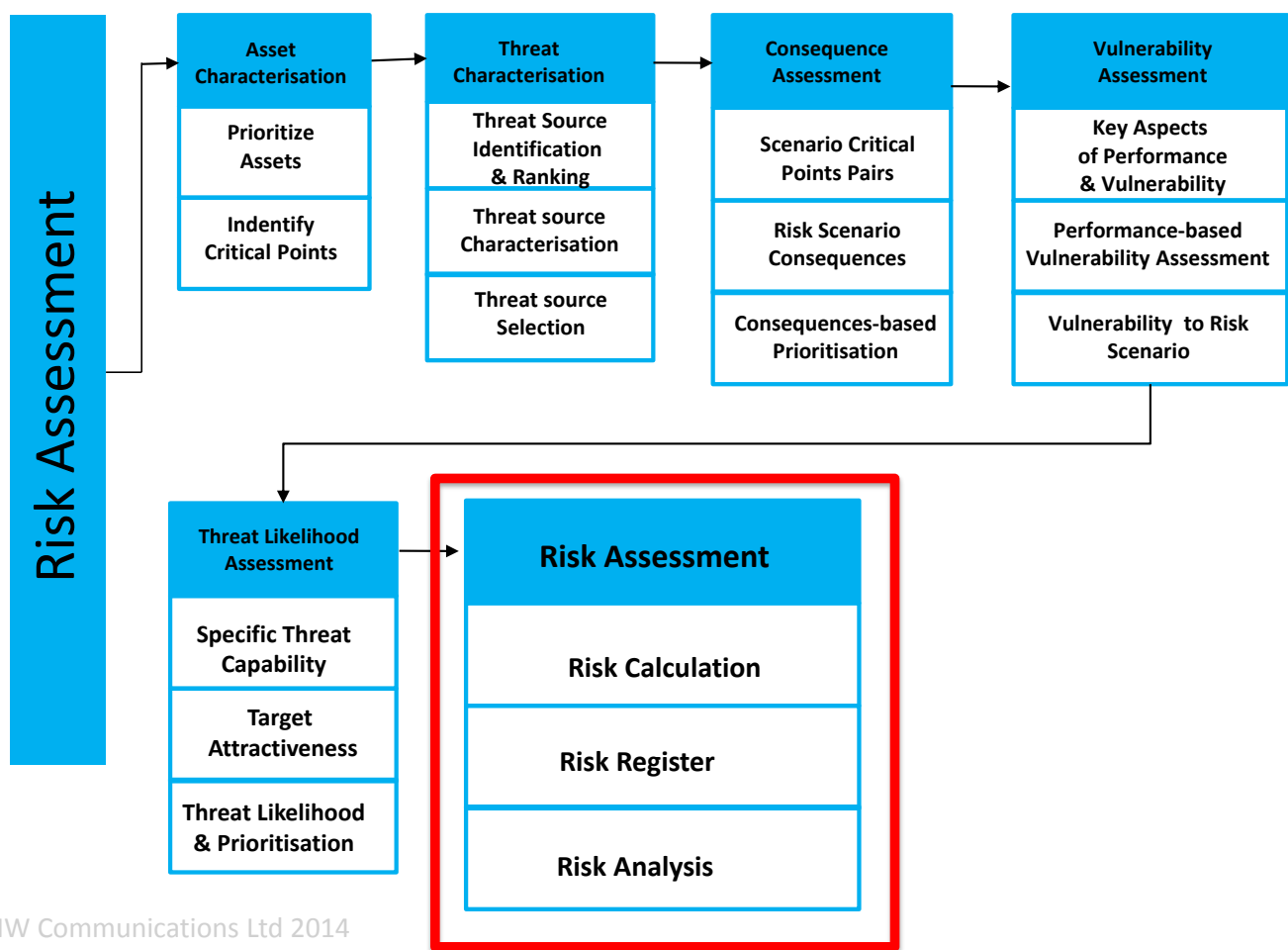
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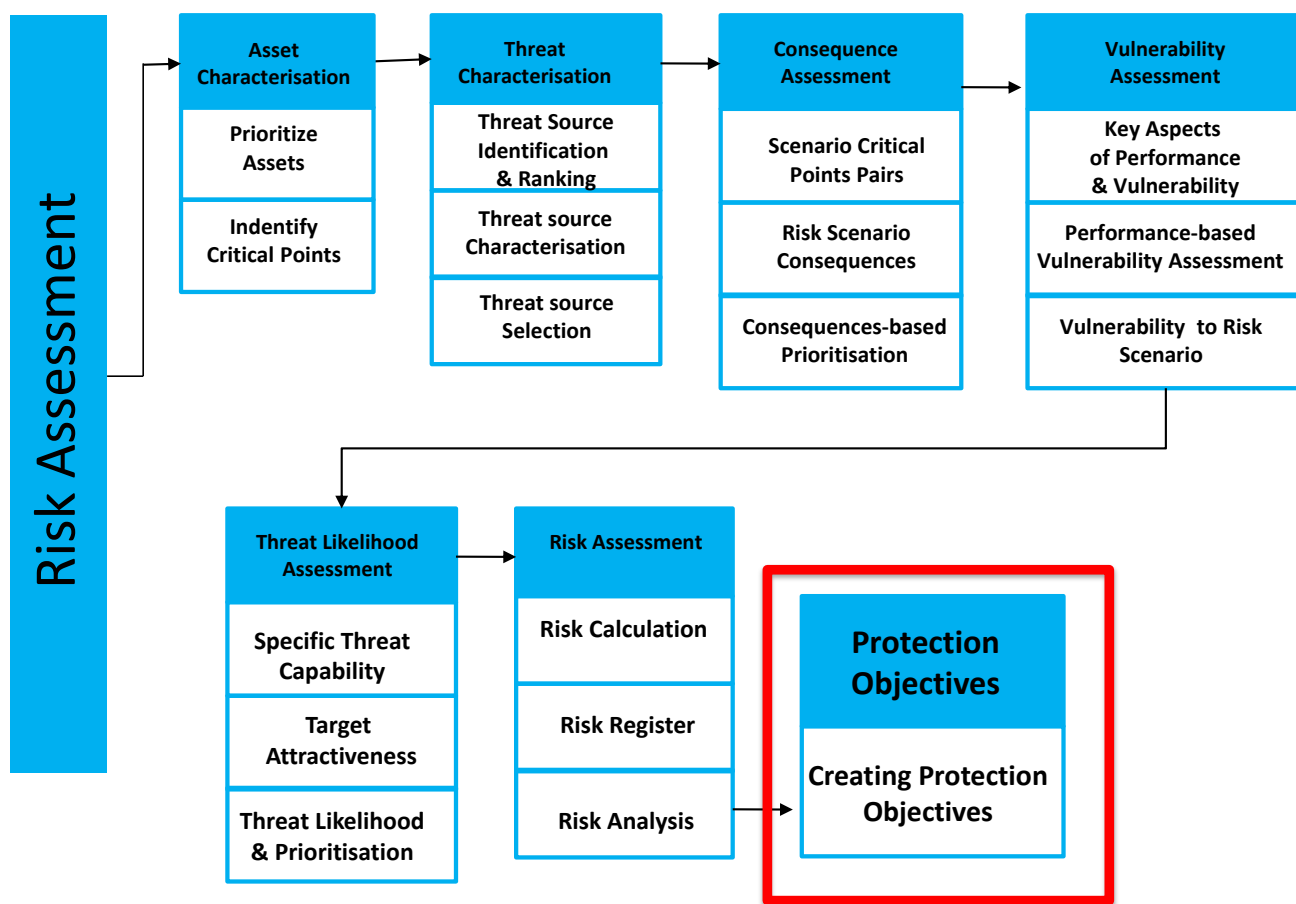
Example of Solution



Example of Solution



Example of Solution



Data Representation

| Consequence Assessment | | | | | | |
|------------------------|-------------|---------------------|--|----------------------|-------|------------|
| Risk Ref | Threat Name | SubThreat Category | Scenario Description | Critical Points Ref | Score | |
| | Terrorists | Religious Extremist | An IED is hand-placed inside the facility and subsequently detonated | CP5, Control Buildin | 90 | Delete Add |

Data Representation

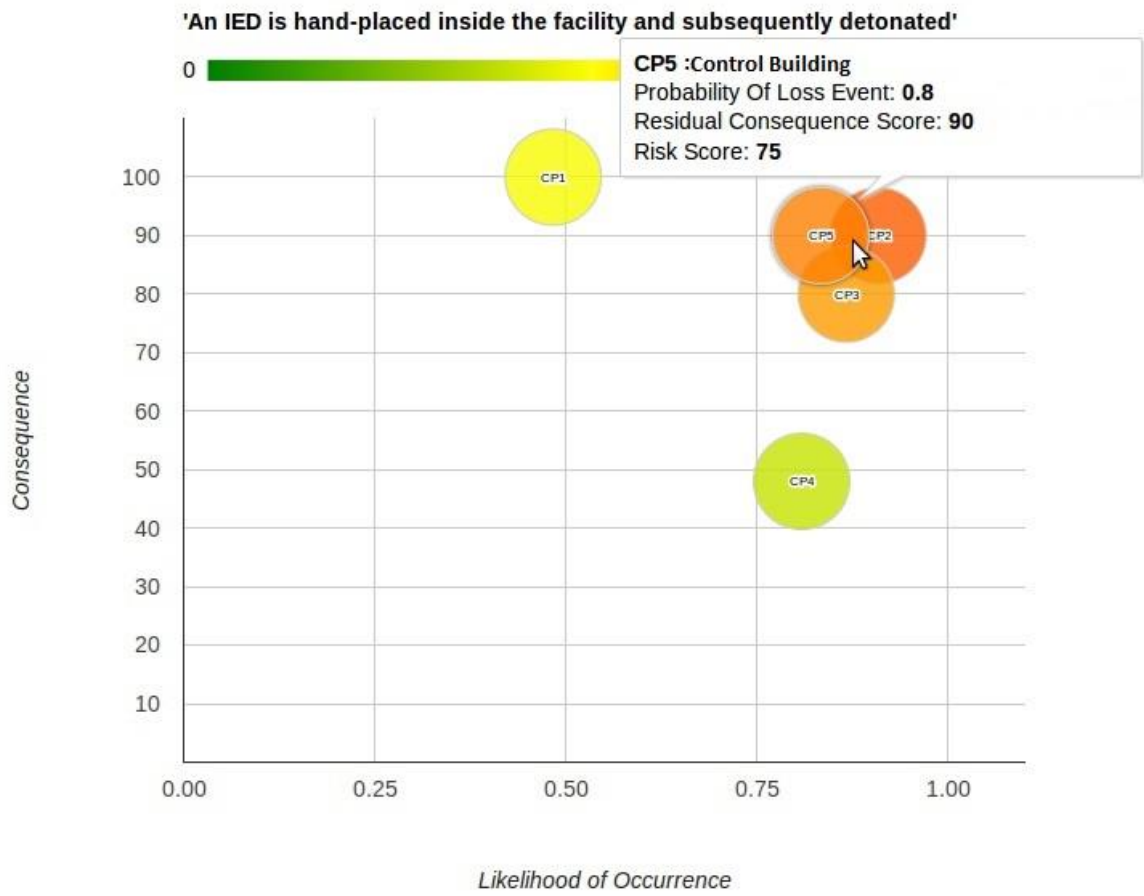
| Consequence Assessment | | | | | | |
|--------------------------|-------------|----------------------|--|----------------------|---------------------------------|-------|
| Risk Ref | Threat Name | SubThreat Category | Scenario Description | Risk Scenario | | Score |
| | | | | Ref | Name | |
| | Terrorists | Religious Extremists | An IED is hand-placed inside the facility and subsequently detonated | CP5, Control Buildin | | 90 |
| <input type="checkbox"/> | Terrorists | Religious Extremists | An IED is hand-placed inside the facility and subsequently detonated | CP1 | Main Distillation Unit | 100 |
| <input type="checkbox"/> | | | | CP2 | Steam Cracker | 90 |
| <input type="checkbox"/> | | | | CP3 | 500V Switch Gear | 80 |
| <input type="checkbox"/> | | | | CP4 | Switch Gear at Main Power Plant | 60 |
| <input type="checkbox"/> | | | | CP5 | Control Building | 90 |

Data Representation

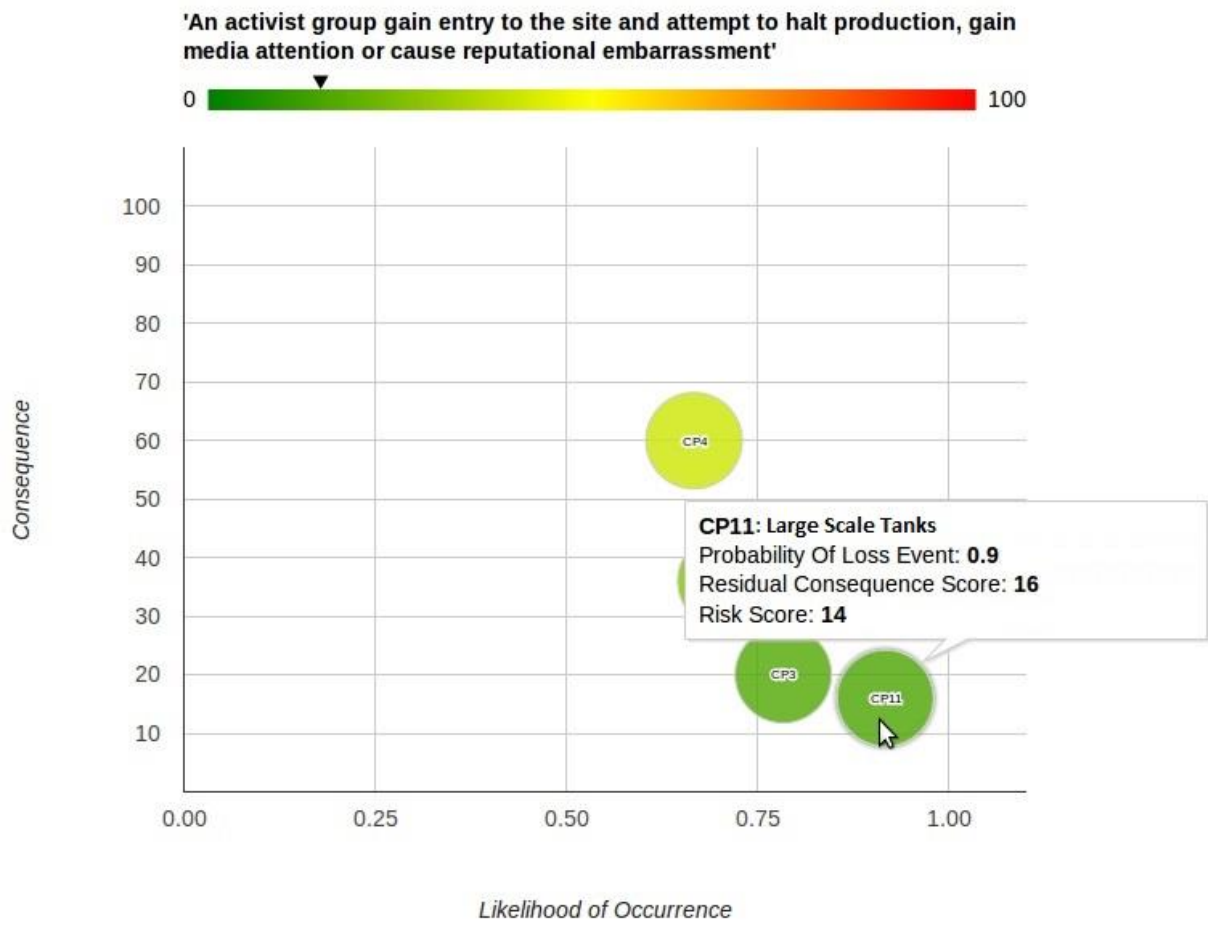
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| Consequence Assessment Criteria Scoring | | | | | | | | | |
| Score | Loss of life/Health | OR | Loss of Production | OR | Loss of Containment | OR | Reputational Damage | OR | Financial Damage |
| 100 | >5 fatalities, or > 100 serious injuries | OR | Complete loss of production for >12 months | OR | Extensive environmental damage lasting >12 months | OR | Extensive environmental damage lasting >12 months | OR | > EUR 200 Mil loss |
| 90 | Up to 5 fatalities, or up to 100 serious injuries | OR | Complete loss of production for >6 months | OR | Major environmental damage lasting >6 months | OR | International concern and/operational loss of operating license | OR | EUR 100 – 200 Mil loss |
| 80 | 1 fatality, or up to 50 serious injuries | OR | Complete loss of production for >3 months | OR | Large scale environmental damage lasting >3 months | OR | | OR | Up to EUR 100 Mil loss |

| | | | | | | |
|--------------------------|------------|----------------------|--|-----|---------------------------------|-----|
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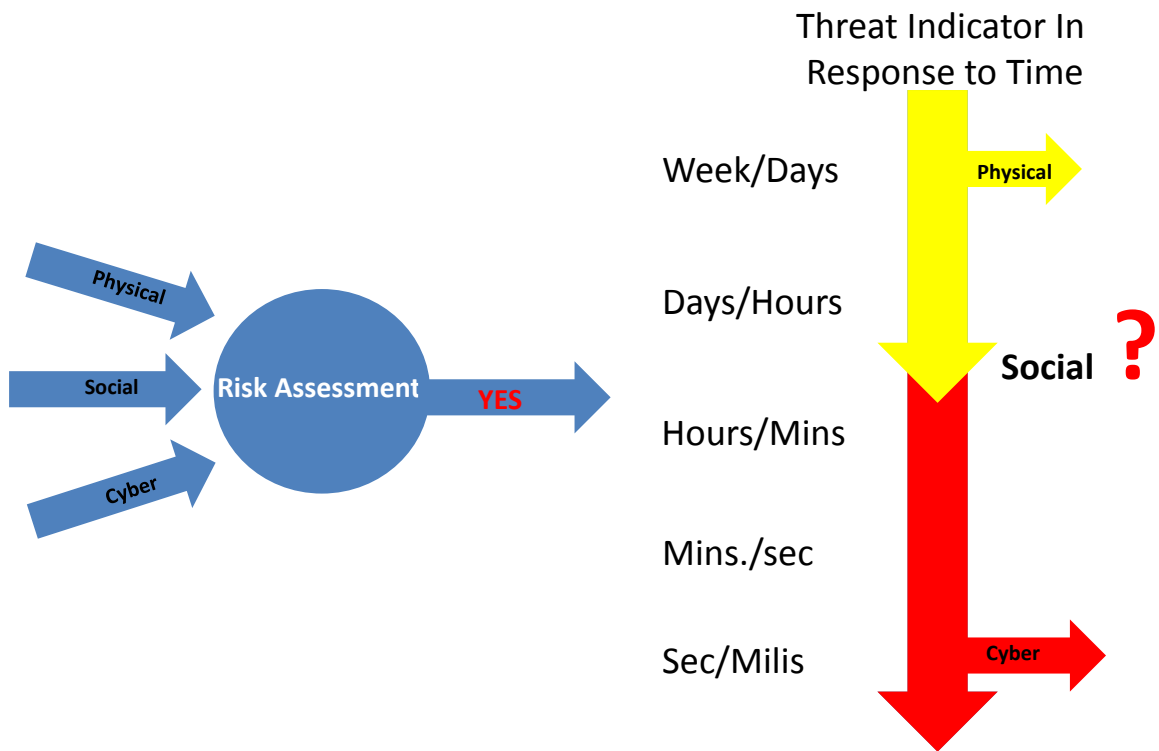
Data Representation



Data Representation



Aspiration for better framework and beyond



Aspiration for better framework and beyond



Conclusion

- Pros and Cons of Available Methodologies
- Building a coherent framework for Risk Assessment
- Aspiration for better framework and beyond

Thanks for Listening

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