Defensie Materieel Organisatie
Ministerie van Defensie

Defensive weapon trends for maritime environment

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27-9-2017

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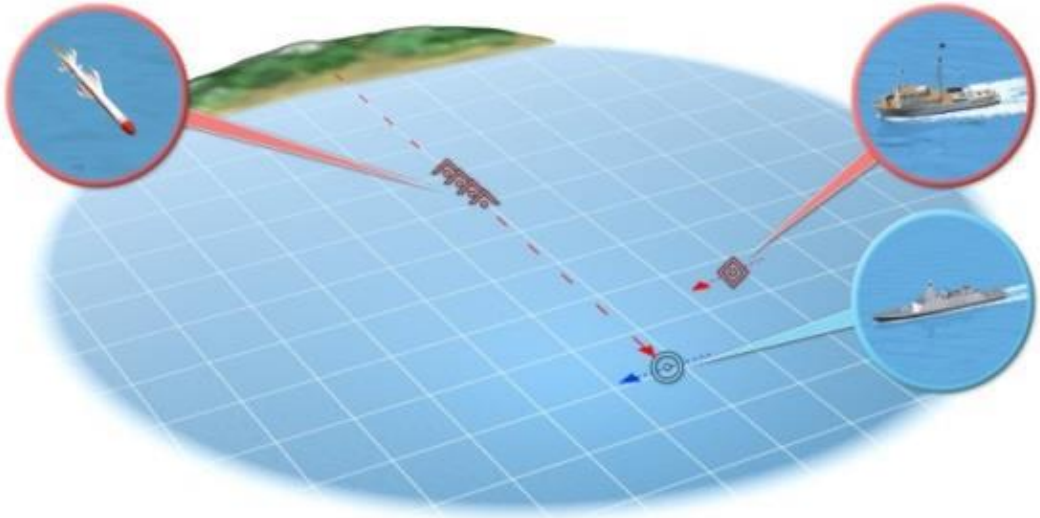
1. Threat is evolving rapidly
2. Classic CIWS falls short
3. Short range trends
4. Trends comparison

Summary

Threat is evolving rapidly

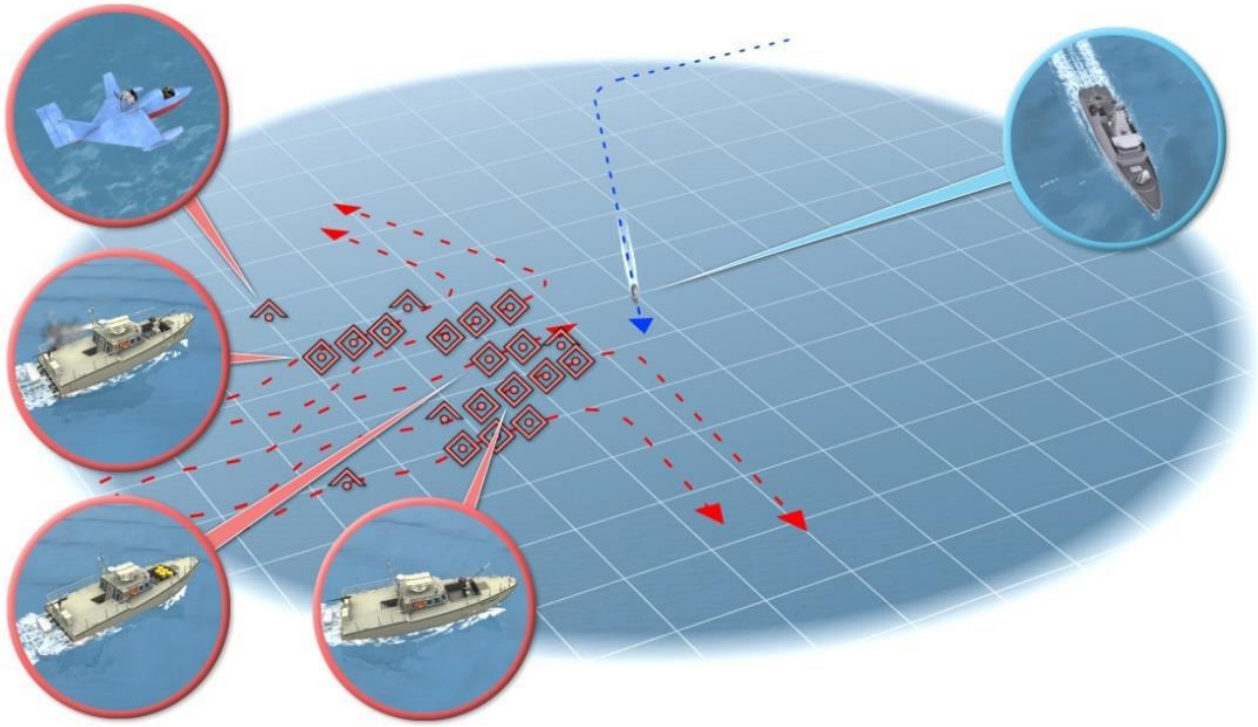
- Faster
- Manoeuvring
- Changing speed
- Saturation

Short reaction time

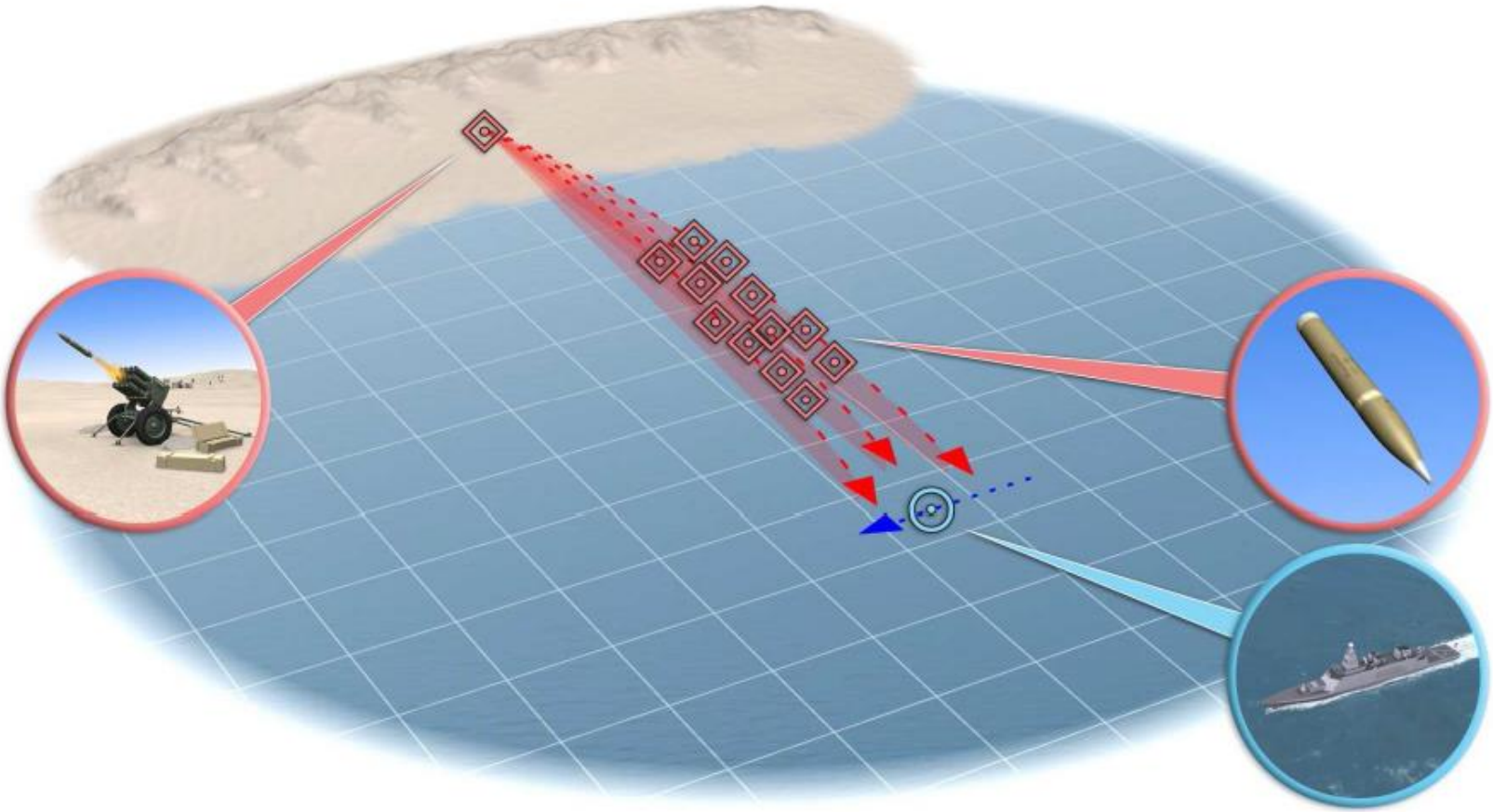


Threat is evolving rapidly

- Coordinated attack
- Saturation
- Combined small surface & air



Threat is evolving rapidly



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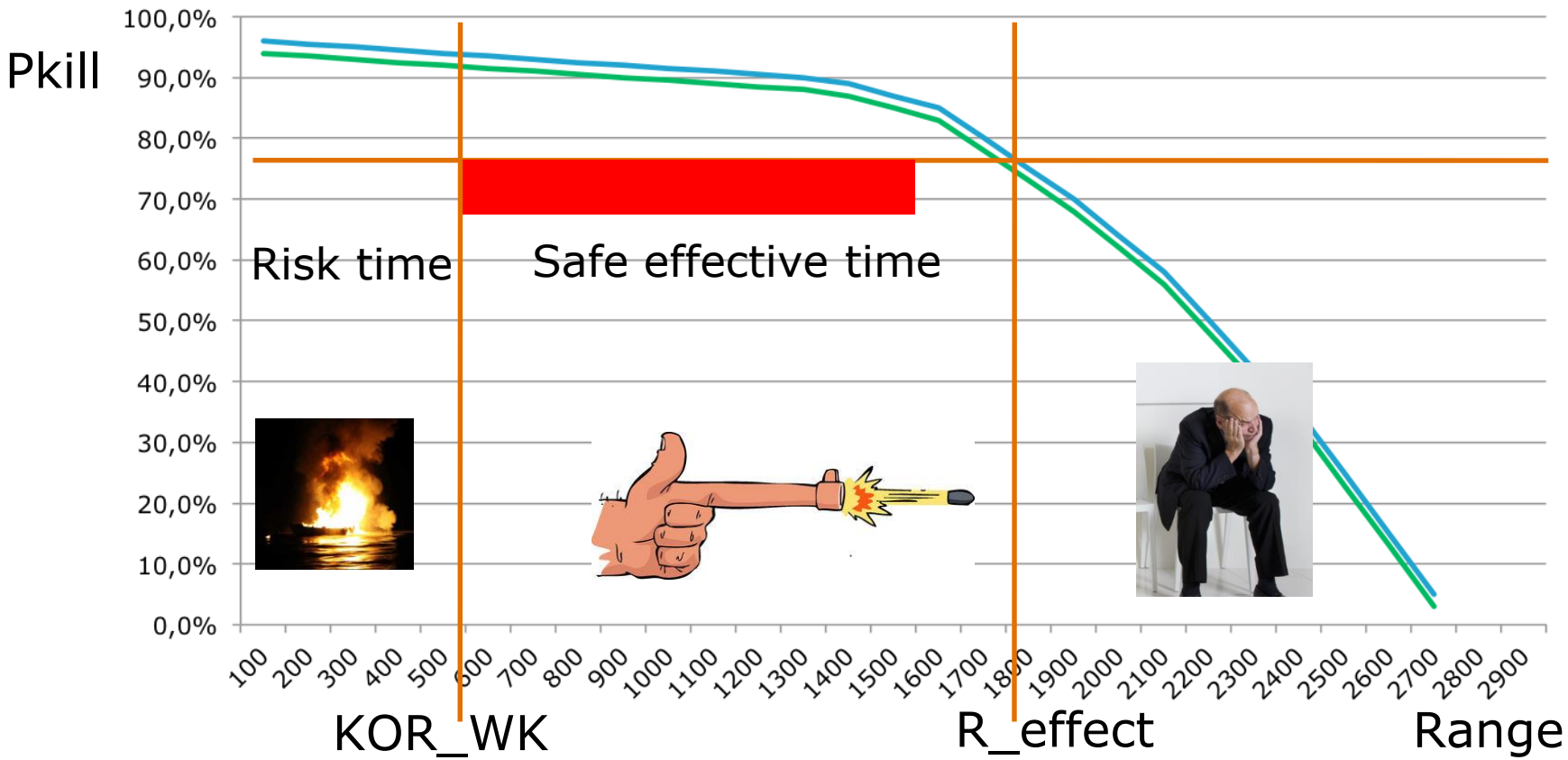
Classic CIWS falls short

- Threat position difficult to predict
- Engagement range window too short for multi target

=> Guided ammo is essential

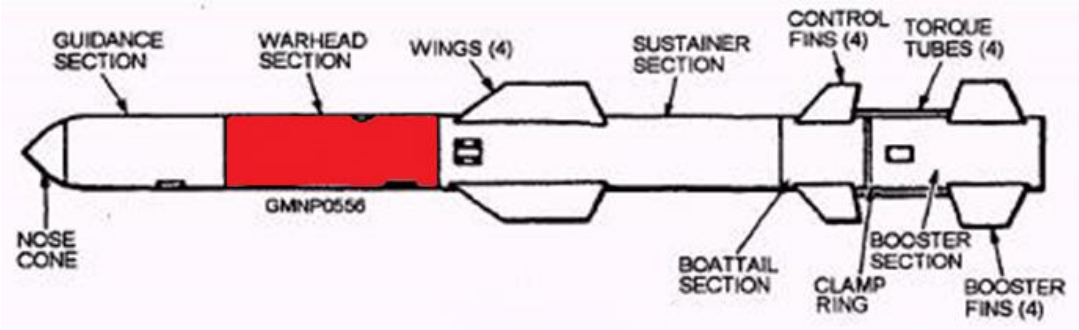
Classic CIWS falls short

Firing policy CIWS not suitable for multi target



Classic CIWS falls short

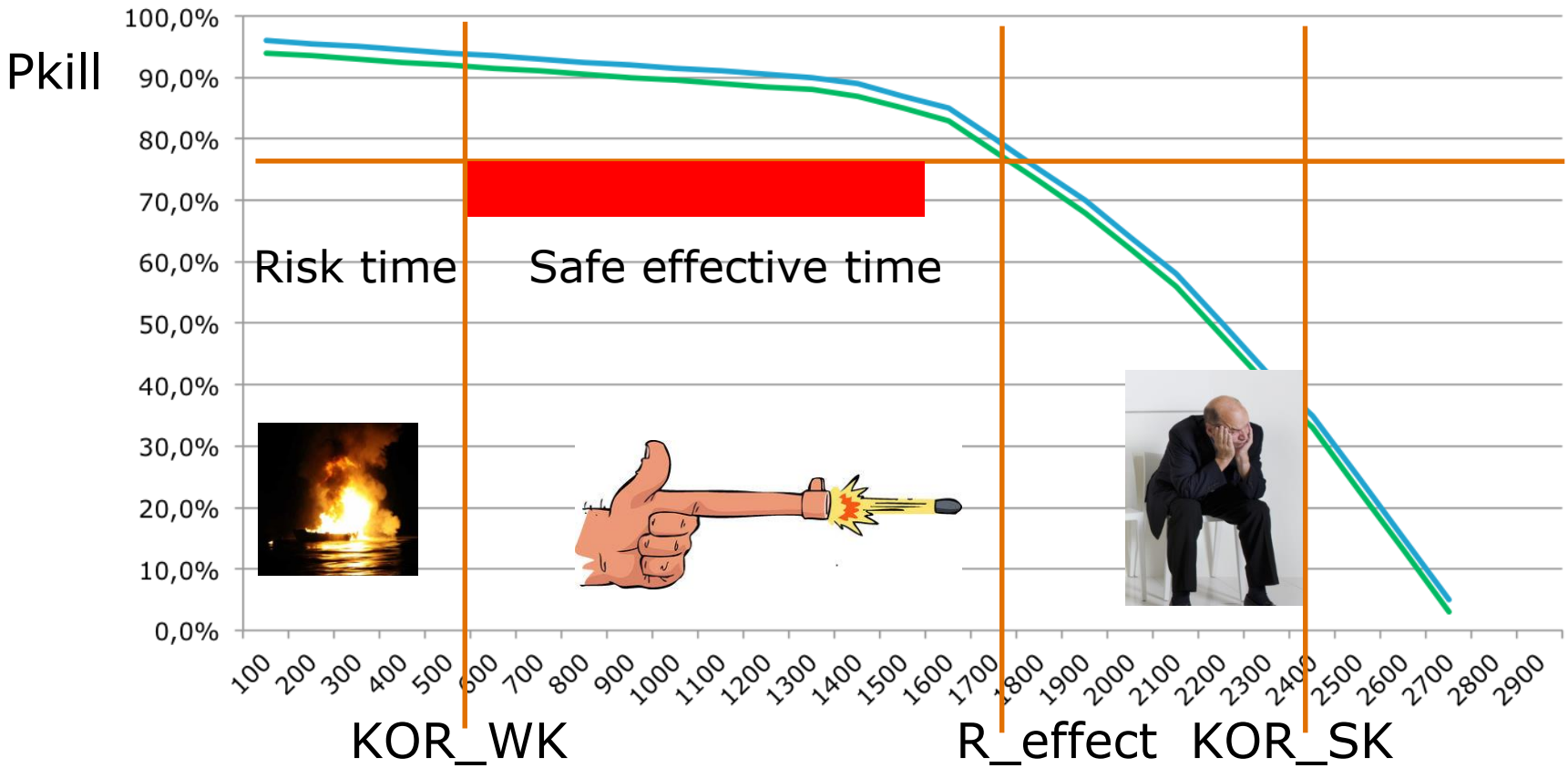
Warhead kill vs system kill



NAAWS: Keep-Out Range increases significantly

Classic CIWS falls short

Firing policy CIWS not suitable for multi target



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Short range trends

Guided ammo developments:

1. Short range IR missile (SeaRAM)
2. Short range Precision Guided Munitions
3. High Energy Laser

Short range trends

Short range trends

Distribution Statement A. Approved for public release.

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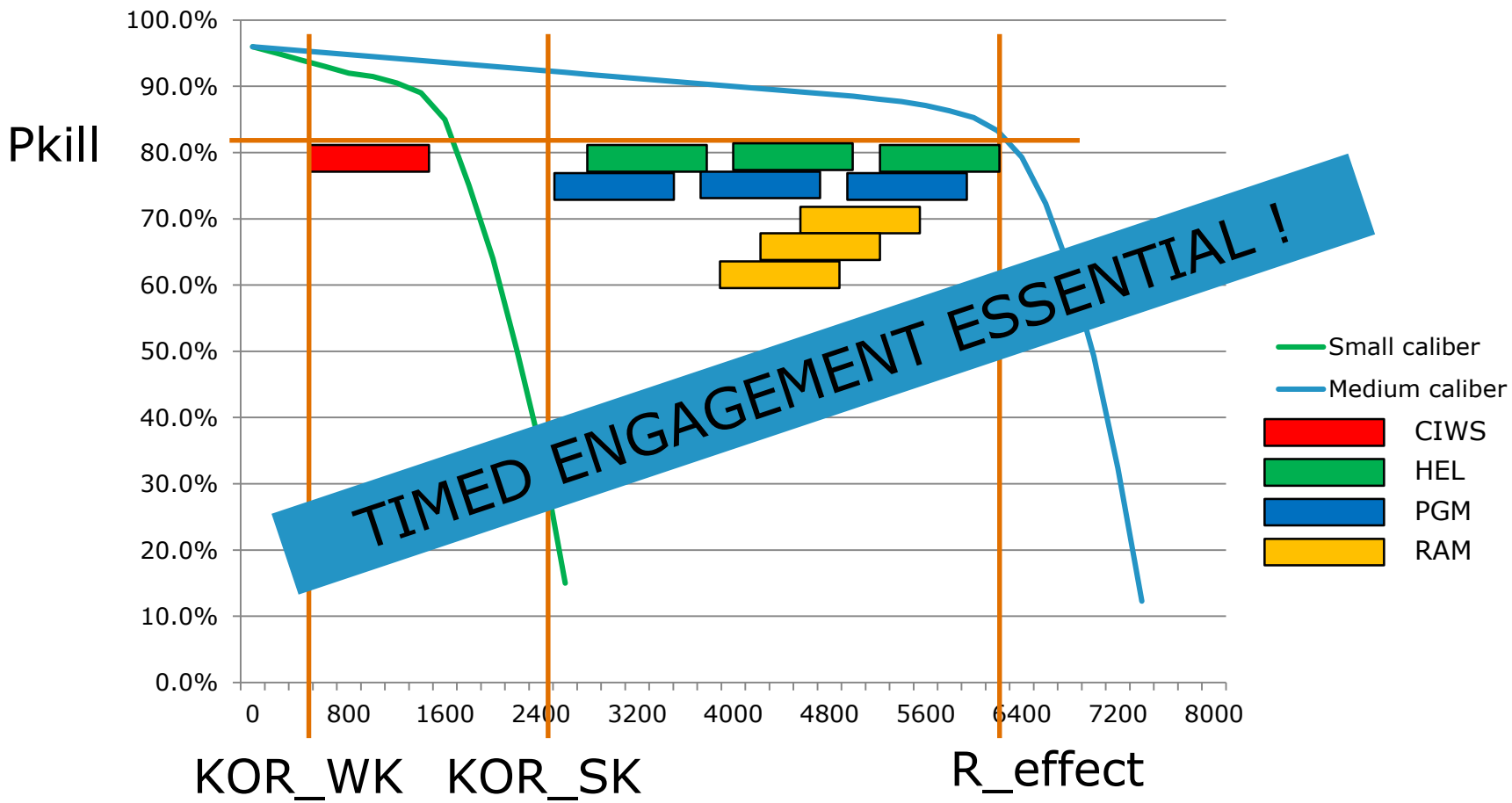
Short range trend comparison

Effect on threat			**150kW**
Boghammer			
C-RAM			
Low Slow Flyer			
Small drone			
Straight subsonic			
Mano subsonic			
Low supersonic			
High supersonic			

Short range trend comparison

Multi engagement			
Magazine depth	5	16	Unlimited
Reload at sea	No	Yes	Not req
Simultaneous engagements	5	2	No
Weapon syst time usage	4-6s	4-6s	Burn time
All weather capability	Yes	Yes	No
Complementary to first layer missile	No	Yes	Yes

Short range trend comparison



Short range trend comparison

Cost			
Development			???
Initial investment			???
Engagement			1 euro
Maintenance cost	High	Low	Low
Upgradability	Low	Medium	High

Summary

Threat is developing rapidly

- Classic CIWS cannot counter new threat

Higher system requirements

- In-flight ammo guidance is required
- Effective range needs to grow to meet System kill range

Different solutions will become available

- Automation essential for multi target scenario
- Required # engagements determines system type

QUESTIONS?