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A security intelligence approach for risk management in drinking water supply systems:

The view of a national security intelligence service

ERNCIP'S TG Water Webinar
30th November 2020

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SUBJECTS

I. Security intelligence and risk management

II. Security threats against drinking water supply systems

III. Security vulnerabilities in drinking water supply systems

IV. Security risk management in drinking water supply systems

I. Security intelligence and risk management

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I. Security intelligence and risk management

Practical concepts

SECURITY

Ideal state of well being, undisrupted, undisturbed and protected integrity of an asset against dangers that are or may be intentionally caused by hostile human actions.

(Security) INTELLIGENCE

Deep knowledge of:

- The hostile human actions that (may) cause the dangers: **Threats**
- Weaknesses exploited or exploitable by the Threats: **Vulnerabilities**
- Pretended or achieved results by the Threats: **Impacts**

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I. Security intelligence and risk management

Why is it important?

Because it provides answers for the following questions:

- **What** do I have to protect my asset against?
- **Why** are those threats important?
- **How** can I best protect my asset (against those threats)?
- **Which** are the best ways to mitigate the impacts from hostile actions?

… and doing that in a **efficient** way

I. Security intelligence and risk management

Deep knowledge of:

- The hostile human actions that (may) cause the dangers
- Weaknesses exploitable or exploited
- Pretended or achieved results

Who has or may have the intention and the ability to attack? ***Threat agents***	State actors Organizations / Groups Lone actors
Why? ***Threat motivations***	Geopolitical tensions / War Terrorism Economic / industrial /financial gains Revenge Others
How? ***Modi operandi***	Explosion; sabotage Espionage Water contamination Cyber attack Theft, damage, trespassing

I. Security intelligence and risk management

Deep knowledge of:

- The hostile human actions that (may) cause the dangers
- Weaknesses exploitable or exploited
- Intendend and achieved results

What waeknesses may be exploited by threat agents? ***Vulnerabilities***	Blind spots / lack of monitorization Unprotected places Abandoned documentation Personal grievances; others Lack of organizational security awareness /culture Others
What consequences are intendend and What might be effectivelly produced? ***Impacts***	Human casualties Terror /demoralisation Coercion Economic loss Illicit gain / advantage Reputational damage Others

II. Security threats against drinking water supply systems

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II. Security threats

Specific security contexts for each water supply system

- Variable geographic and political contexts.
- Distinct threat actors, intentions, capabilities and threat levels.
- Different characteristics of each drinking water supply system

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II. Security threats

State actors

THE TIMES OF ISRAEL

Iran cyberattack on Israel's water supply could have sickened hundred

JUNE 18, 2020
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PM said to present Gantz with annexation options, including only symbolic move

By TOI STAFF

TV report says proposals floated by Netanyahu range from around 1/3 of the West Bank to a small section; UAE crow prince: We are working against this ille move

3 former top IDF officers said to reject offer to head annexation

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ISRAEL'S ALLEGED REPRISAL ON PORT SEEN AS 'GENTLE REMINDER'

Iran cyberattack on Israel's water supply could have sickened hundreds – report

Western official says April hack aimed to raise chlorine to dangerous levels; Israeli official says attack began tit-for-tat on civilian targets

By TOI STAFF and AGENCIES
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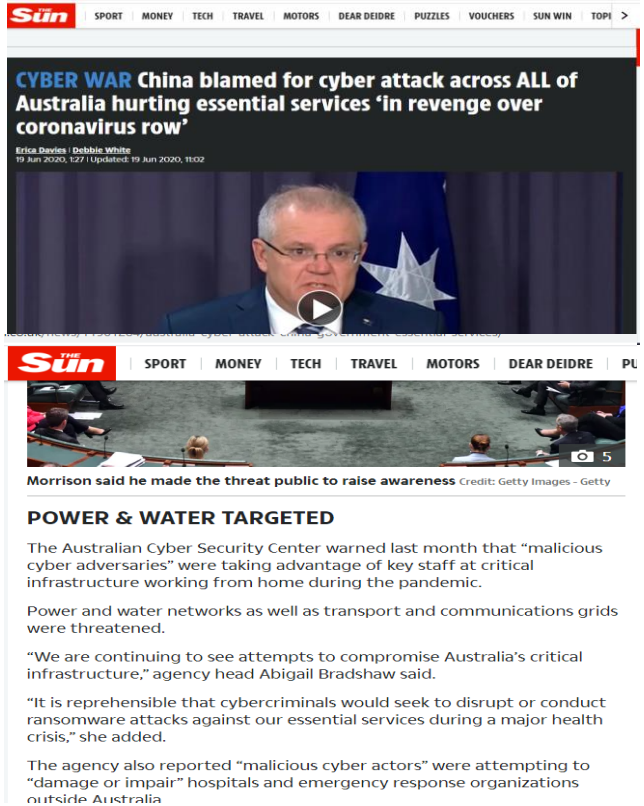

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CYBER WAR China blamed for cyber attack across ALL of Australia hurting essential services 'in revenge over coronavirus row'

Erica Davies | Debbie White
19 Jun 2020, 1:27 | Updated: 19 Jun 2020, 11:02

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Morrison said he made the threat public to raise awareness Credit: Getty Images - Getty

POWER & WATER TARGETED

The Australian Cyber Security Center warned last month that "malicious cyber adversaries" were taking advantage of key staff at critical infrastructure working from home during the pandemic.

Power and water networks as well as transport and communications grids were threatened.

"We are continuing to see attempts to compromise Australia's critical infrastructure," agency head Abigail Bradshaw said.

"It is reprehensible that cybercriminals would seek to disrupt or conduct ransomware attacks against our essential services during a major health crisis," she added.

The agency also reported "malicious cyber actors" were attempting to "damage or impair" hospitals and emergency response organizations outside Australia

II. Securi

Terrorism

- Persiste

Noticias Sociedad

QUERÍA ATENTAR CONTRA LOS "INFIELES"

Prisión para un yihadista que quería envenenar el agua de Cádiz

El juez de la Audiencia Nacional Fernando Grande-Marlaska ha decretado prisión provisional y sin fianza para el marroquí Abdellatif Aoulad Chiba, detenido el miércoles en la Línea de la Concepción (Cádiz) acusado de intentar envenenar el agua de los depósitos de cámpines y otros complejos turísticos.

Gosto Partilhar 48 Twittear G+1 1 0 Comentarios

Tweet

Abdellatif Aoulad Chiba (camiseta blanca) | Foto: EFE

antena3.com | Madrid | Actualizado el 20/08/2011 a las 17:50 horas

Según el auto hecho público, el juez imputa al detenido, de 36 años, un delito de integración en organización terrorista y otro de conspiración para el asesinato terrorista.

II. Security threats

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Wednesday, 20 February, 2002, 16:15 GMT

'Cyanide attack' foiled in Italy

The four allegedly had maps marked with water systems

Italian police say they have arrested four Moroccans who were planning a chemical attack in Rome, targeting buildings which included the United States embassy.

The four men, aged between 30 and 40, were detained on Tuesday in a dawn raid on a flat in the Tor Bella Monaca area in the south of the Italian capital. The news did not emerge until early on Wednesday.

"We will be discussing the matter with Washington today"

US Embassy spokeswoman

COMMONWEALTH GAMES

BBC SPORT

lastampa.it/cronaca/2018/11/29/news/sardegna-voleva-avvelenare-le-acque-arrestato-palestinese-affiliato-all-isis-1.340

TOP NEWS

LA STAMPA

Sardegna, voleva avvelenare le acque. Arrestato palestinese affiliato all'Isis

Preparava un attacco con armi chimiche. Gli inquirenti: "Ci aveva già provato in Libano"

Macomer era il luogo ideale. E persino simbolico. Non solo perché a 500 metri dalla casa sarda di Amin Alhaj Ahmad c'è una caserma della Brigata Sassari, sede di quel reggimento dell'Esercito italiano che la guerra al terrorismo l'ha combattuta in prima linea in Iraq, in Afghanistan e in

II. Security threats

Terrorism

23AUG16: Ways to kill "infidels"

- **Spread rat poison in fruits and vegetables in markets;**
- **Inject poison in pigs in slaughter houses;**
- **Contaminate water reservatoires;**
- **Make false bom threats to create chaos and economic losses ein the targeted places.**

II. Security threats

Terrorism

There are several obstacles for an unconvencional attack be well succeded

- Production
- Handling
- Quantities needed to overcome the dilution effect

But they are not insurmountable…

- Production can be made in an easy way and or from easily accessible products. (ex.: rodenticides; insecticides; pesticides; ricin)
- The handling of some of these substances and there is broad information online.
- Some of the available substances are highly toxic and require a less amount of water to produce nefarious effects.
- Some attacks can be made from placez where there is a small amount of water but from where the dispersio of the toxic agente can be made.

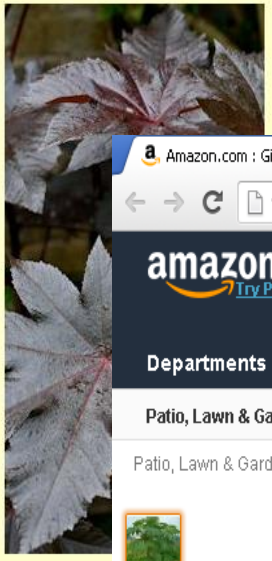
Type	Denomination	Weaponization	Context	Usability
Inorganic chemist	Sulphuric acid	Yes	Social conflict	High
Inorganic chemist	Potassium cyanite	Yes	Terrorism	High
Inorganic chemist	Chlorine	Possible / Yes	Terrorism, hacktivism	High
Inorganic chemist	Fluoride	Yes	Hacktivism, disgruntled worker	High
Inorganic chemist	Herbicides (glyphosate, Sodium chlorate)	Yes	Terrorism, personal motivations	High
Inorganic chemist	Rodenticides (fluoroacetamids)	Yes / Likely	Personal motivations, Terrorism	High
Inorganic chemist	Insecticids	Yes / Likely	Personal motivations Terrorism	High
Inorganic chemist	Antifreeze (ethyleneglycol)	Likely /Yes	Terrorism, personal motivations	Medium
Inorganic chemist	Mercury	Yes	Vandalism	High
Inorganic chemist	Sodium azide	Yes	Personal motivations	Medium
Inorganic chemist	Petrol and diesel	Yes	Disgruntled worker	High
Inorganic chemist	Nitric acid	Likely	Terrorism	Medium
Microbiological	Anthrax	Yes	Biochemical warfare	Medium
Microbiological	Brucellosis	Yes	Biochemical warfare	Low
Microbiological	*C. perfringens*	Yes	Hacktivism	Medium
Microbiological	*Salmonella*	Yes	Terrorism	Medium
Microbiological	Tularemia	Yes	Biochemical warfare, terrorism	Low
Microbiológico	Plague (*Yersinia pestis*)	Likely	Biochemical warfare	Low
Microbiological	Fever Q (*Coxiella burnetti*)	Yes	Biochemical warfare	Low
Biotoxin	Botulinum toxin	Yes	Biochemical warfare, terrorism	Low
Biotoxina	Micotoxin T-2	Likely	Biochemical warfare	Low
Biotoxina	Aflatoxin	Yes	Biochemical warfare	Low
Biotoxina	Ricin	Yes	Terrorism	Medium

Castor Bean (Ricinus) seeds

seedrack.com/indiv/ricinus_communis.html?gclid=COfz0Jqk28cCFaEewwodEGoNHA

(Click to navigate seed catalog pages)

Seeds include sowing instructions



Castor Bean (Ricinus)

- Castor Oil Plant -
seeds in stock

Amazon.com : Giant Zanzibar

www.amazon.com/Giant-Zanzibar-Castor-Seeds-Ricinus/dp/B000RGZFEI

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Giant Zanzibar Castor Bean 7 Seeds -Ricinus- Green Leaf

by Hirts: Seed; Trees & Shrubs

80 customer reviews | 3 answered questions

Price: $3.29 + $0.49 shipping

In Stock.

Estimated Delivery Date: April 29 - May 16 when you choose Standard at checkout.
Ships from and sold by Free breathing.

- THE CASTOR BEAN is a shrub-like plant with large, long-stemmed leaves that are lobed like fingers
- If you grow Castor Beans in your garden and you have children it is safest to remove & destroy the seed pods before they mature
- Seeds, bark & leaves are all somewhat toxic, but the greatest concentration of the toxin occurs in the seeds & their pods
- This variety can grow 20 feet tall
- 7 Seeds

12 new from $1.41

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II. Security threats

Terrorism

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On May 15, 2016, the Ibn Taymiyyah Media
Salafi-jihadi movement and ISIS supporters
"Instructions by the Heroes for the Lions of

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News

Islamist extremist ricin plot foiled by German police

Police officers of a special unit wearing protective clothes and respiratory masks raid a flat in Cologne, Germany CREDIT: DAVID YOUNG/AFP/GETTY IMAGES

Follow By Justin Huggler, BERLIN
14 JUNE 2018 • 3:14PM

A suspected Islamic extremist arrested in Cologne succeeded in making ricin and was planning a "biological weapon attack" in Germany, prosecutors said on Thursday.

Sief Allah Hammami, a 29-year-old Tunisian, was held on Wednesday along with his German wife after police found large quantities of the deadly toxin his apartment.

It is believed to be the first time Islamic extremists in Europe have

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US & Canada

US woman admits testing homemade ricin on neighbours

1 December 2017 Share

Ms Miller said she made the ricin from the castor beans she grew from plants in her apartment

A woman living in a US nursing home has admitted making ricin and testing it on other elderly residents.

Betty Miller has been charged after ricin was found in a care home in Shelburne, Vermont.

Investigators said Ms Miller made the highly toxic powder from castor plant seeds.

Ms Miller told authorities she made between two and three tablespoons of ricin in

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II. Security threats

Other actors

JIHAD WATCH

Muslim hackers infiltrate water utility's control system, change levels of chemicals used to treat tap water

MARCH 28, 2016 12:12 PM BY ROBERT SPENCER 67 COMMENTS

III. Security vulnerabilities in drinking water supply systems

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III. (Some) Security vulnerabilities

- Broad targets with multiple attack oportunities and a potential high amount of victims: Not only the ones directly affected but also the other consumers that may be feel vulnerable to such attacks.
- Soft targets (in most cases).
- Significant impacts (direct and indirect) in case of destruction or disruption.
- Water quality monitorization not made in real time (in many cases).
- Limited effectiveness of some protection measures and procedures.

III. (Some) Security vulnerabilities

- Water treatment plants have the means for a chemical attack
- Insufficient background checks por staff with access to sensitive locations
- Fallible procedures of communication / crisis response due to a severe threat.
- Lack of reporting of suspicious situations
- Excessive public disclosure of information of some drinking water supply systems.

IV. Security risk management in drinking water supply systems

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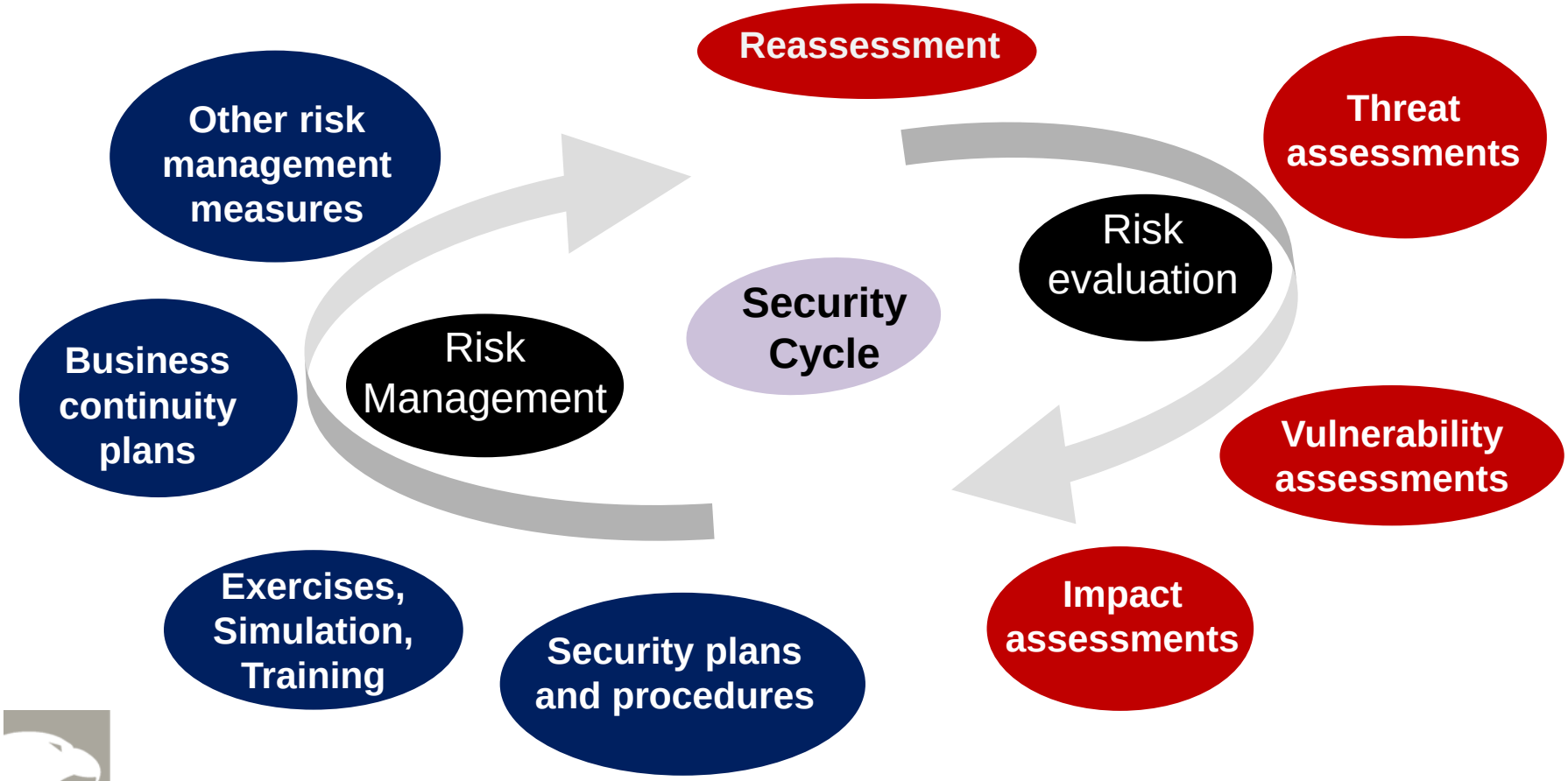
IV. Security risk management



IV. Security risk management

Holistic security perspective

Protection measures and procedures are adequate to reduce the risk from all relevant threats and vulnerabilities

IV. Security risk management

Synergistic effect

Protecting against more serious threats increases the protection against other less serious but more frequent threats

IV. Security risk management

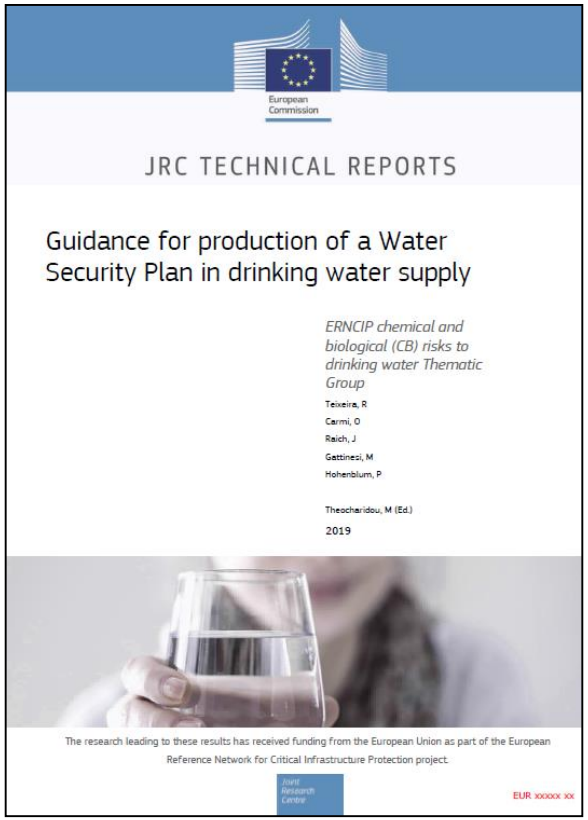
Cooperation

High impact threats, although less frequent, require cooperation to achive an effective protection

- Water management entities
- Intelligence services
- Law enforcement
- Municipalities
- Regulators
- Private security
- Others *ad hoc*

III. Security risk management

Four phase approach to risk management in drinking water supply



1. Planning and preparation

2. Protection: event detection and preparation

3. Response: management of the event

4. Remediation and recovery

Thank You for your attention

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