



STOP-IT

## H2020 STOP-IT PROJECT

Enhancing the security of water critical infrastructure at strategic, tactical and operational level with solutions for preventing, detecting, responding to, and recovering from cyber and physical threats.

[www.stop-it-project.eu](http://www.stop-it-project.eu)

### Physical and Cyber security integration and modelling at strategic and tactical levels

SPEAKER:

**CHRISTOS MAKROPOULOS, PROFESSOR**



**KWR**

National Technical  
University of Athens



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## OUR WORLD IS GOING DIGITAL – FAST!

We are in the middle of a **transformation** from “*physical infrastructure*” to “*physical with some sensors*” to “cyber-physical infrastructure”

*Analog*

**Digital**

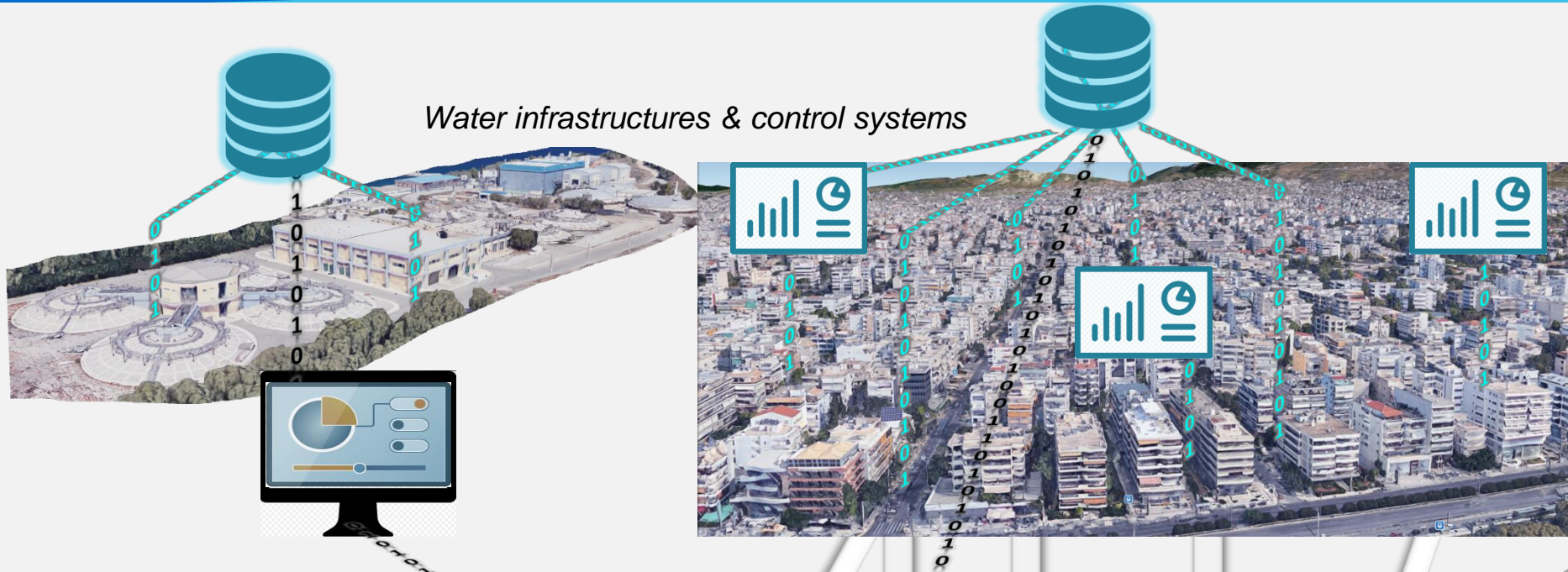


- **Advantages are numerous:** automation, adaptability, efficiency, functionality, reliability, safety, and usability of large systems
- **But there is a catch:** Exposure to an expanded attack surface...

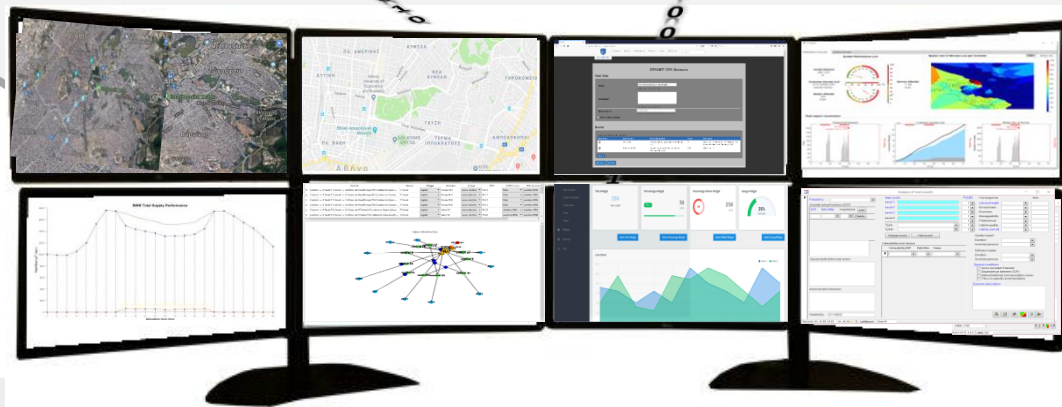


STOP-IT

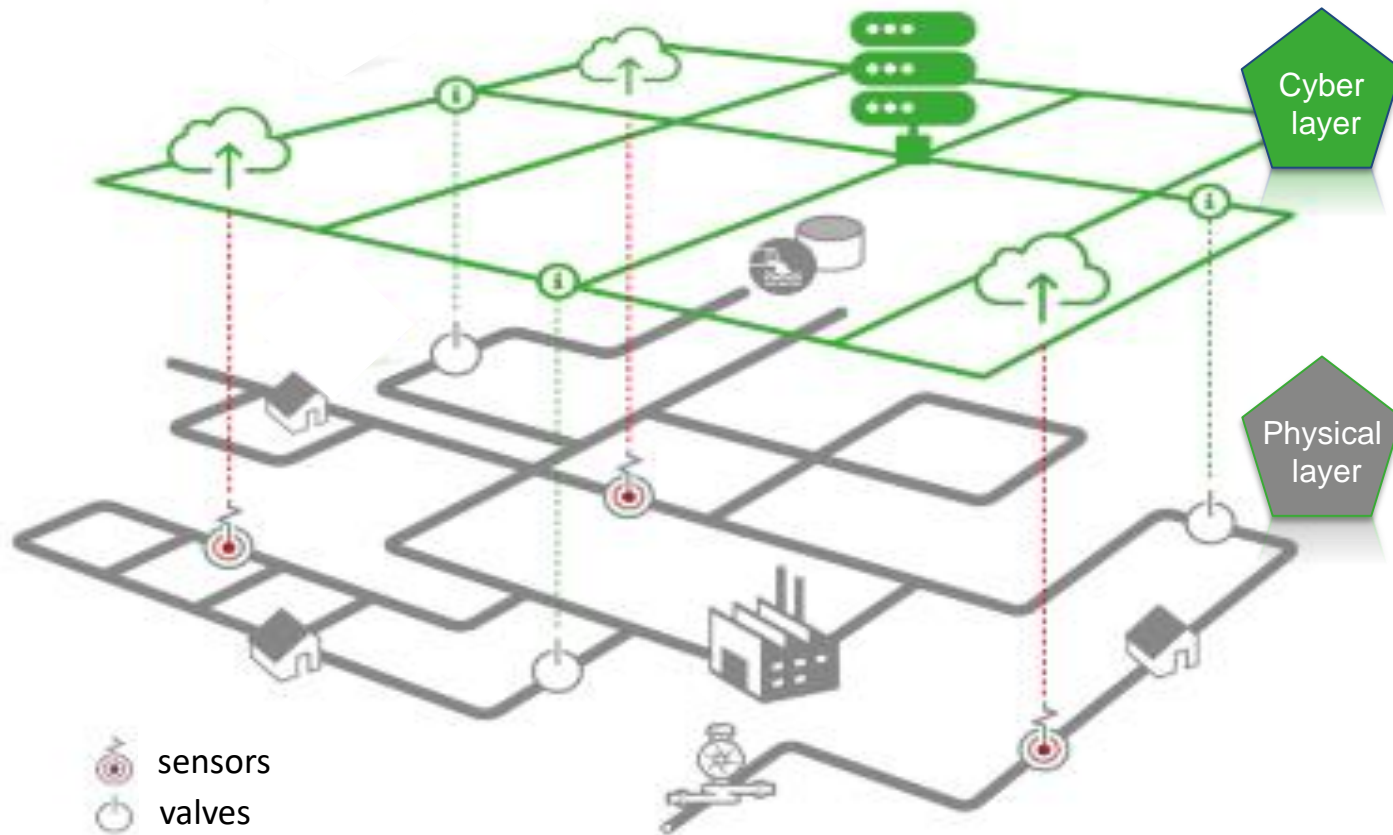
# Water infrastructures are becoming more and more Cyber-physical infrastructures



**Water infrastructures**  
As cyber-physical infrastructures



SCADA room



We argue that since the **cyber** and **physical** systems interact continuously, and **cascading effects** between them are not easy to track (or back-track to improve designs or identify sources of attacks) we need to combine cyber and hydraulic engineering knowledge to develop **cyber-physical security concepts and tools**.



Modular components of  
the STOP-IT risk management platform

**Strategic &  
Tactical**

**Operational**

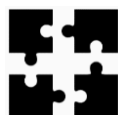
**Solutions** that support:

- **Strategic/tactical planning and post action assessment**
- **Operational decision making**

towards cyber-physical security of water infrastructures



**Scalable**



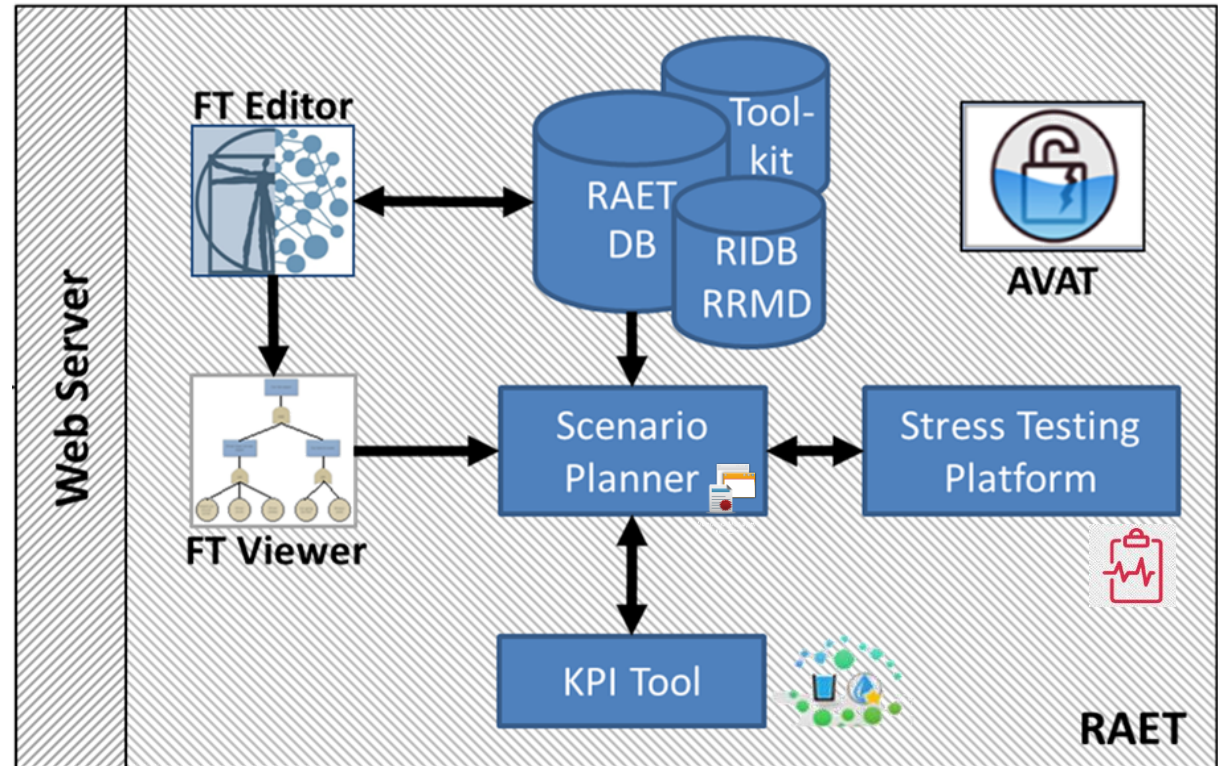
**Adaptable**



**Flexible**

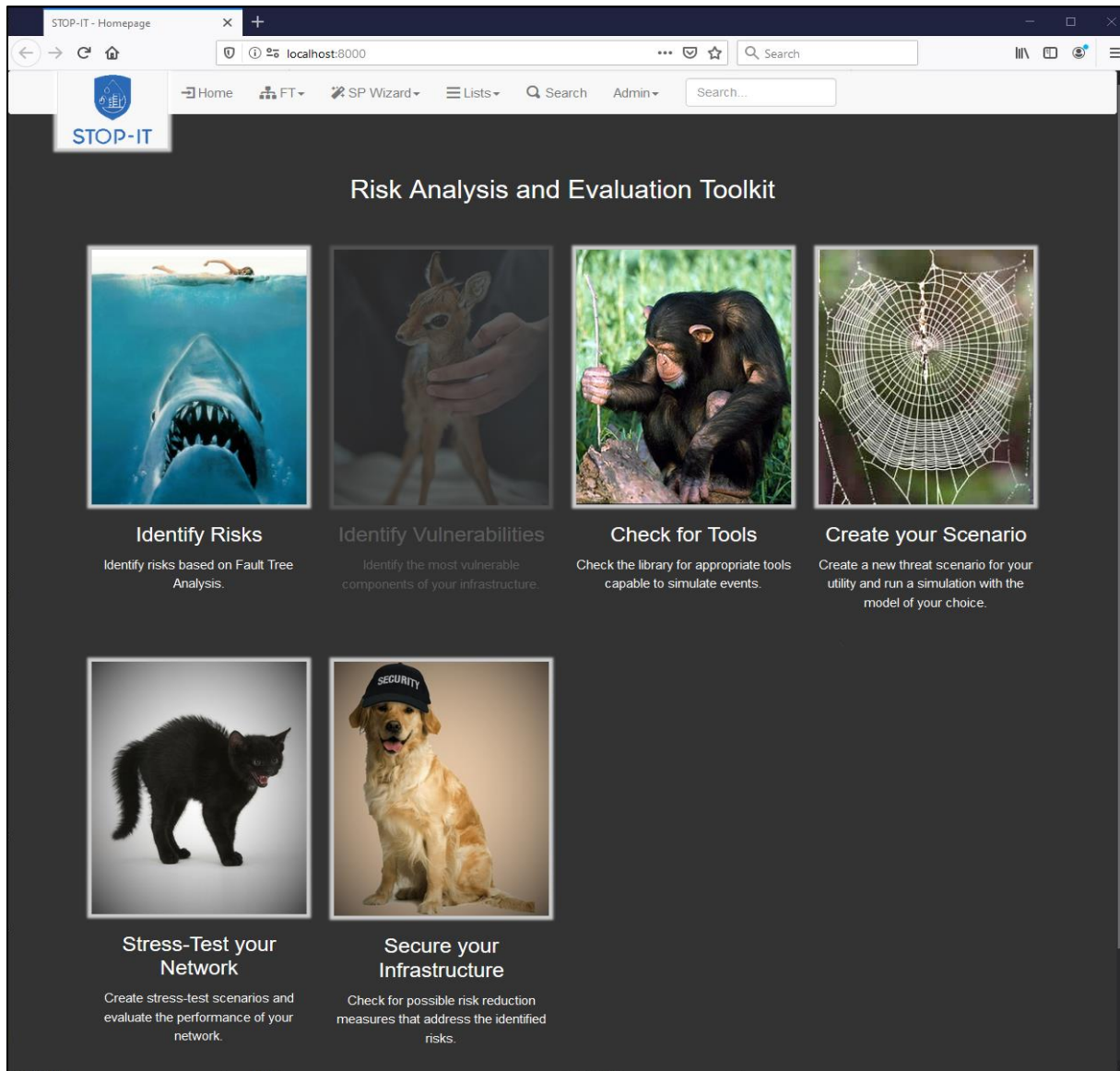
STOP-IT modules:

- ❑ **Module1: Risk Assessment & Treatment Framework**
- ❑ Module 2: Secure wireless sensor communications module
- ❑ Module 3: Toolbox of technologies for securing IT and SCADA
- ❑ Module 4: Toolbox of technologies for protecting against physical threats in CI
- ❑ Module 5: Cyber Threat Incident Service
- ❑ Module 6: Real-Time anomaly detection system
- ❑ Module 7: Public Warning System-Secure Information Exchange Technologies
- ❑ Module 8: Reasoning Engine
- ❑ Module 9: Enhanced Visualisation Interface for the water utilities



*High level use-cases of Module I components:*

1. **Assess vulnerability (AVAT)**
2. **Navigate through potential risks & design/configure multiple risks scenarios**
3. **Simulate physical system interacting with their cyber layer**
4. **Visualise system's response and quantify/assess overall impacts**
5. **Assess scenarios of measure(s) implementation to the system**



## Scenario Planner

**Identify** risks and build a network specific **threat scenario**



## Stress Test Platform

**Simulate** the scenario

## KPI tool

**Evaluate** the scenario consequences

## Scenario Planner

Explore appropriate **treatment** options



# STOP-IT Scenario Planner: Identifying Risks Through FTs

A **user-friendly graphical environment** for the investigation of threat and cascading effect scenarios

The screenshot displays the 'Fault Trees' section of the STOP-IT application. The top navigation bar includes links for Home, FT, SP Wizard, Lists, Search, and Admin. The main content area shows a table of fault trees with the following data:

Operations	Name	Description	Root Event	Nr of Events	Created
	STOP-IT Quantity FT	STOP-IT Water Quantity Fault Tree based on the Urban Water Cycle	Gate 147	Gates: 87, Basic events: 141	May 10, 2019, 6:24 a.m.
	STOP-IT Quality FT	STOP-IT Water Quality Fault Tree based on the Urban Water Cycle	Gate 120	Gates: 56, Basic events: 77	May 10, 2019, 6:56 a.m.

Below the table, it indicates 'Showing 1 to 2 of 2 entries' and provides a 'New FT' button. The interface also includes a search bar and pagination controls.

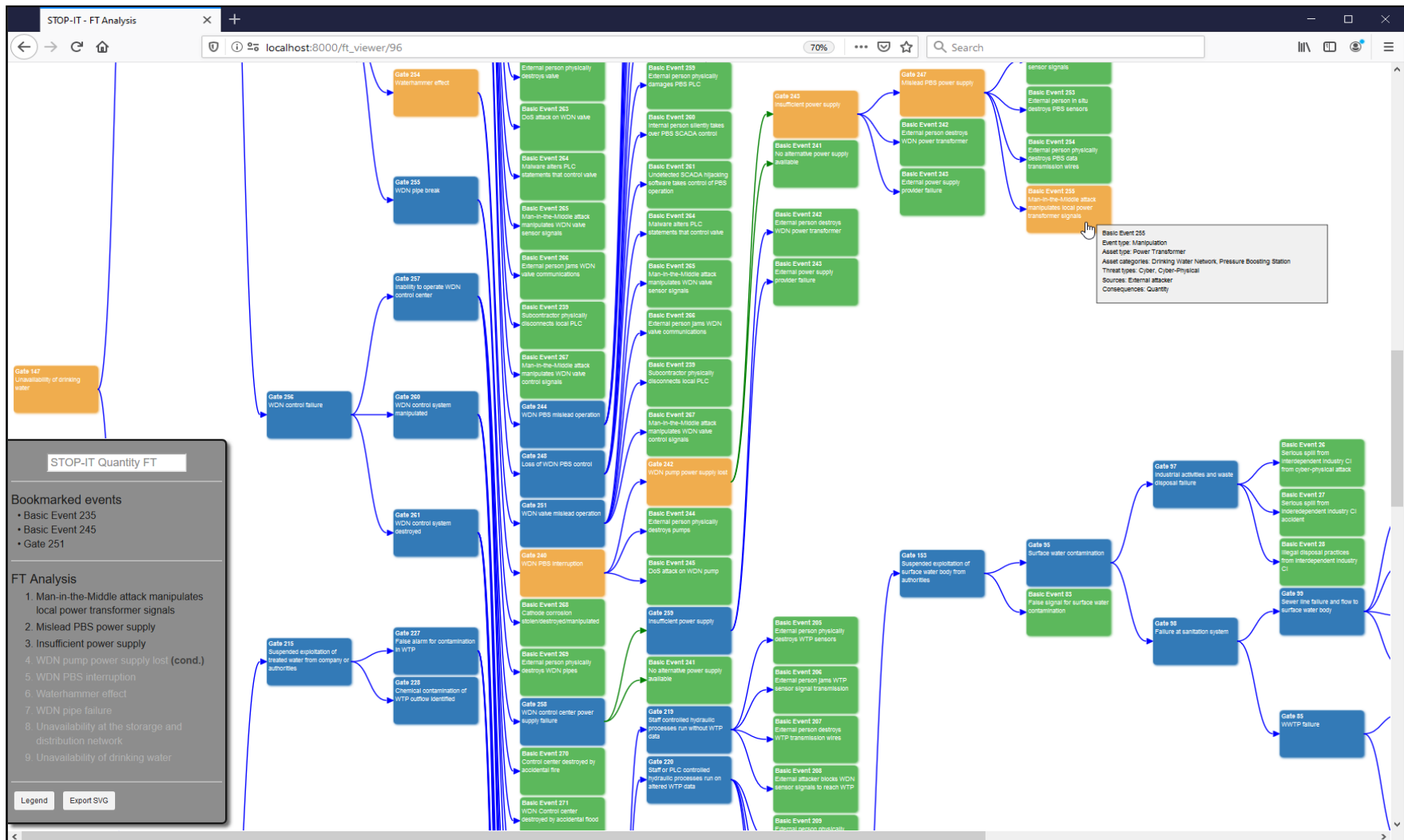
*GUI of FT Viewer of SP*

Users may utilise any Quantity or Quality FT:

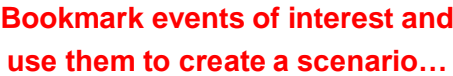
- **Interact with STOP-IT generic predefined FTs** for an all hazard approach (cyber-physical attacks, natural disasters, human error, etc.). *OR*
- **Customise existing FTs or create new FTs** by using the PSA Explorer and then **Load the user- developed FTs** (based on an open PSA format)



# STOP-IT Scenario Planner: Identifying risks through FTs



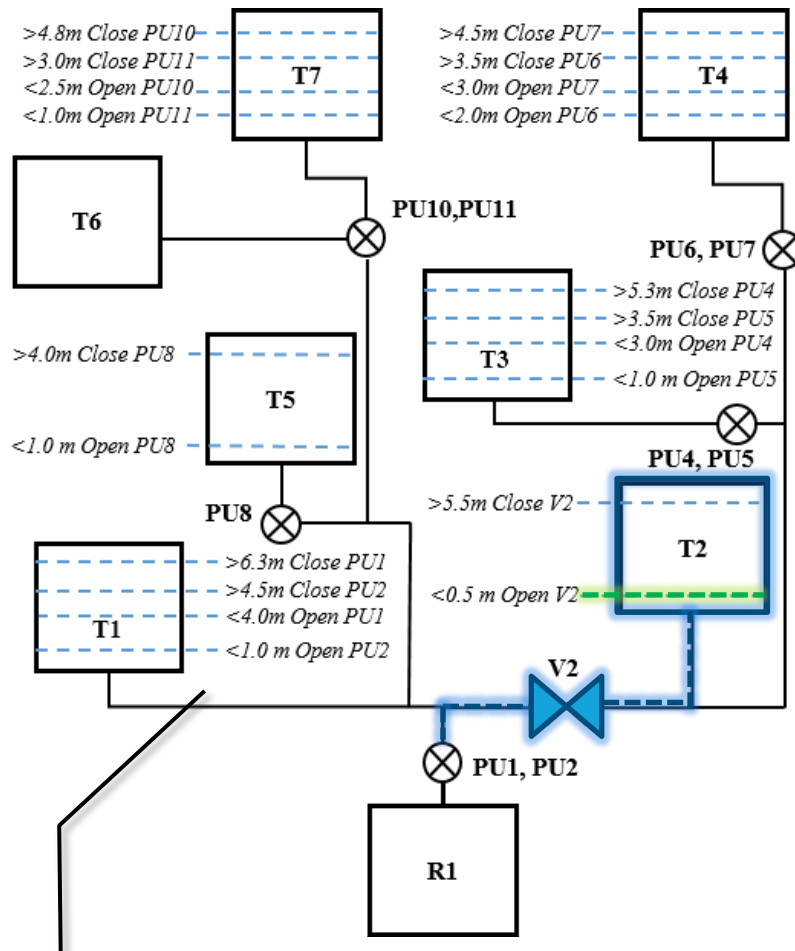
Use a FT architecture to visualise the **event cascade** from a basic event (e.g. an attack) to the undesired end event (e.g. water supply disruption)



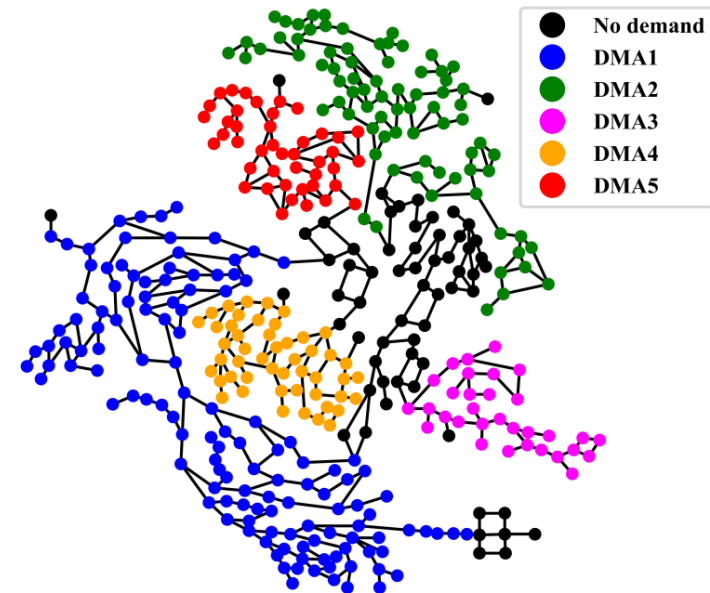


# STOP-IT Scenario planner: A look behind the scenario we explore

## Simplified schematic representation of WDN Cyber-physical control logic



C-town DMAs



Sensor data that lead to actuator response through PLC or SCADA control



# STOP-IT Scenario Planner: Building a scenario

## GUI of SP: Building an EPANET-CPA scenario

New Epanet CPA Scenario

Main Data

Name: IWA webinar scenario  
A unique name for the scenario

Description: Manipulation of a C-Town tank sensor (ID: T2) for the purposes of IWA webinar - Structured and seamless risk management workflow in the STOP-IT RAET hub  
Short description of the scenario

Base scenario: C-Town BAS  
Scenario to be used as Base scenario for this one

☐ This is a Base scenario

Cancel Save

*Creating a scenario*

Events

1. Event 2. Asset 3. Parameters

Select from overall 5 events the one associated with the scenario

ID	Name	Description	Asset Type	Event Type	Basic or Intermediate
4482	Basic Event 235	External person in situ manipulates WDN tank level sensor	Sensor	Manipulation	Basic
4492	Basic Event 252	Man-in-the-Middle attack manipulates WDN PBS sensor signals	Sensor	Manipulation	Basic
4496	Basic Event 250	Malware alters PLC statements that control pump	Control System	Manipulation	Basic
4509	Basic Event 267	Man-in-the-Middle attack manipulates WDN valve control signals	Transferred Information	Manipulation	Basic
4957	Basic Event 153	External attacker manipulates WTP transmission devices	Transmission Devices	Manipulation	Basic

Showing 1 to 5 of 5 entries

Filter  
Use filters to narrow down the list of events  
Search event...  
☒ Bookmarked events  
Event Type (1)  
☐ Destruction  
☐ Interruption  
☒ Manipulation  
☐ Pollution  
Asset Type  
Fault Tree

Previous Next Cancel

*Defining an event/threat*

1. Event 2. Asset 3. Parameters

Selected event: Basic Event 235: External person in situ manipulates WDN tank level sensor  
Select an asset that is affected by the event

Asset ID	RIDB Asset ID	RIDB Asset Type	EPANET Asset Type ID	Modeled Asset Type	Relation
T1	14	Sensor	100	Sensor	Related asset: Tank
T2	14	Sensor	100	Sensor	Related asset: Tank
T3	14	Sensor	100	Sensor	Related asset: Tank
T4	14	Sensor	100	Sensor	Related asset: Tank
T5	14	Sensor	100	Sensor	Related asset: Tank
T6	14	Sensor	100	Sensor	Related asset: Tank
T7	14	Sensor	100	Sensor	Related asset: Tank

Showing 1 to 7 of 7 entries

Previous Next Cancel

*Defining the asset(s) affected*

1. Event 2. Asset 3. Parameters

Selected event: Basic Event 235: External person in situ manipulates WDN tank level sensor  
Selected asset: T2 (Sensor)  
Specify parameter values for the scenario

Duration: 15  
Duration in full hours for which the event will last. During this time the service provided by the asset will be interrupted completely. After the specified time the asset will resume full operation.

Value: 6.2  
A real number indicating the fake tank level in metres

Start time: 5  
An integer indicating the beginning of the event in hours after simulation start.

Cancel Save










Previous Finish Cancel

*Defining the simulation parameters*



Stress-Test Procedures

Show 10 entries

Operations	Name	Base scenario	Created
  	ST procedure 2	Tank level sensor manipulation 2-10h	2020-04-06
  	ST Procedure 3	Tank level sensor manipulation 2-20h	2020-04-06
  	Pollution and sensor manipulation	Pollution and sensor manipulation	2020-05-05

Showing 1 to 3 of 3 entries



*Creating a ST procedure*



Stress-Test Procedure

Name\*   
A unique name for the stress-testing procedure

Description   
Short description of the stress-testing procedure

Base scenario\*   
Select the base scenario for stress-testing. Excluded are scenarios having no parameters to calibrate

(\*) Required fields

*Specifying ST procedure attributes*

Control variables

Name	Minimum	Maximum	Method	Nr. of values	Event
Duration	<input type="text" value="0"/>	<input type="text" value="16"/>	<input type="text" value="Incremental"/>	<input type="text" value="4"/>	Event: Basic Event 235 Asset: T2 (Sensor)
Value	<input type="text" value="5.5"/>	<input type="text" value="5.9"/>	<input type="text" value="Random selection"/>	<input type="text" value="4"/>	Event: Basic Event 235 Asset: T2 (Sensor)
Start time	<input type="text" value="2"/>	<input type="text" value="6"/>	<input type="text" value="Random selection"/>	<input type="text" value="2"/>	Event: Basic Event 235 Asset: T2 (Sensor)

*Specifying the values for the control variables*

Name: New ST procedure

Description: Tank level sensor manipulation 2-10h

Base scenario: Epanet CPA

Tool: 2020-05-31 08:35

Created: 2020-05-31 21:15

Modified: 5 out of 16

Completed runs: 6' 8"

Estimated remaining time: Running

Status:

**Control Variables**

- External person in situ manipulates WDN tank level sensor (Basic Event 235), Asset: T2, Values: 8-16, Method: Incremental
- External person in situ manipulates WDN tank level sensor (Basic Event 235), Asset: T2, Values: 5.7-5.7, Method: Random selection
- External person in situ manipulates WDN tank level sensor (Basic Event 235), Asset: T2, Values: 2-8, Method: Random selection

KPI1: Customer minutes lost [Customer Minutes]  
KPI2: Customers experiencing insufficient service [Customers]  
KPI3: Nodes insufficiently supplied [Nodes]  
KPI4: System service hours lost [Hours]  
KPI5: Unmet demand [liters]

Copy

CSV

Nr	Executed	Control variables	Time [s]	KPI1	KPI2	KPI3	KPI4	KPI5
5	2020-05-31 21:18	Duration 10, Value 5.70, Start time 2	29.60	4326947.42	44674.20	174.00	4.00	603318.96
4	2020-05-31 21:17	Duration 8, Value 5.70, Start time 6	30.57	0.00	26719.98	118.00	0.00	2981.16
3	2020-05-31 21:17	Duration 8, Value 5.70, Start time 3	29.68	0.00	27060.31	119.00	0.00	1042.92
2	2020-05-31 21:16	Duration 8, Value 5.70, Start time 2	30.55	1875542.69	39869.37	173.00	2.00	261876.60
1	2020-05-31 21:16	Duration 8, Value 5.70, Start time 2	46.80	1875542.69	39869.37	173.00	2.00	261876.60

*Create a series of scenario variants*







# STOP-IT Scenario Planner: Managing scenarios

STOP-IT							
<div> <a href="#">Home</a> <a href="#">FT</a> <a href="#">SP Wizard</a> <a href="#">Lists</a> <a href="#">Search</a> <a href="#">Admin</a> </div>							
Scenarios							
Show 10 entries		Search: <input type="text"/>					
Operations	Tools	Base scenario	Name	Description	Events	Created	Executed
	Epanet CPA	C-Town BAS	IWA webinar scenario	Manipulation of a C-Town tank sensor (ID: T2) for the purposes of IWA webinar - Structured and seamless risk managem...	1	2020-05-31 19:11	
	RISKNOUGHT		Sensor manipulation	Sensor manipulation at junction J411	1	2020-05-05 19:03	2020-05-05 20:25
	RISKNOUGHT		Pollution only	Pollution at junction J411	1	2020-05-05 19:00	2020-05-05 19:11
	RISKNOUGHT		Pollution and sensor manipulation	Pollution and sensor manipulation at junction J411	2	2020-05-05 16:30	2020-05-05 16:56
	Epanet CPA	C-Town BAS	Tank level sensor manipulation 2-20h		1	2020-04-06 07:56	2020-04-06 07:56
	Epanet CPA	C-Town BAS	Tank level sensor manipulation 2-10h	Tank level sensor manipulation 2-10h and storage tank failure	1	2020-04-06 07:52	2020-04-06 07:52
	Epanet CPA	C-Town BAS	C-Town BAS	Business-As-Usual Scenario of C-Town	0	2019-03-20 13:56	2019-03-22 17:02

✓ **Scenario Planner**  
**Identify** risks and  
 build a network specific  
**threat scenario**

❑ **Stress Test Platform**  
**Simulate** the scenario  

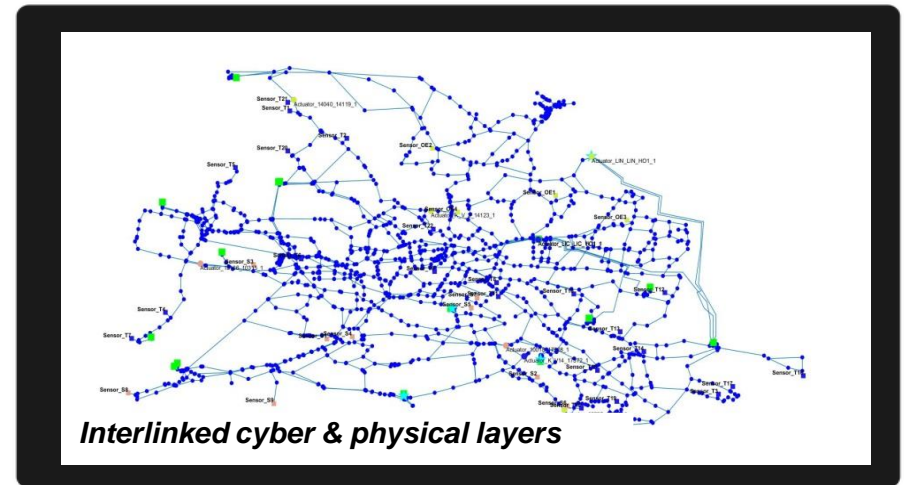
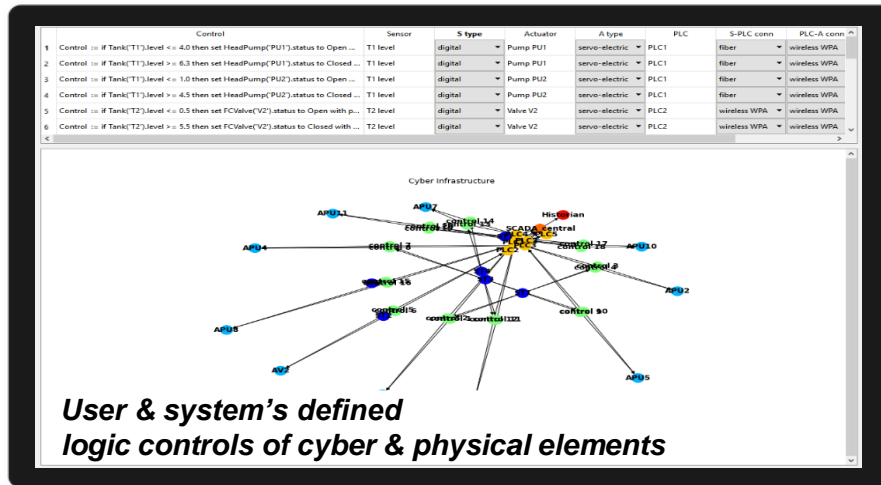
❑ **KPI tool**  
**Evaluate** the scenario  
 consequences

❑ **RRMD-RIDB**  
 Explore appropriate  
**treatment** options



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# Stress-Testing Platform: Physical & cyber interlinked layers



The core Stress Testing Platform is an **EPANET** based model

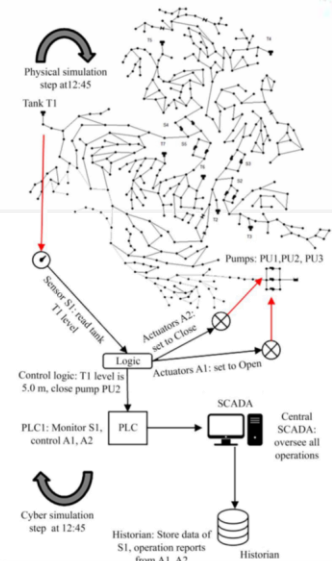
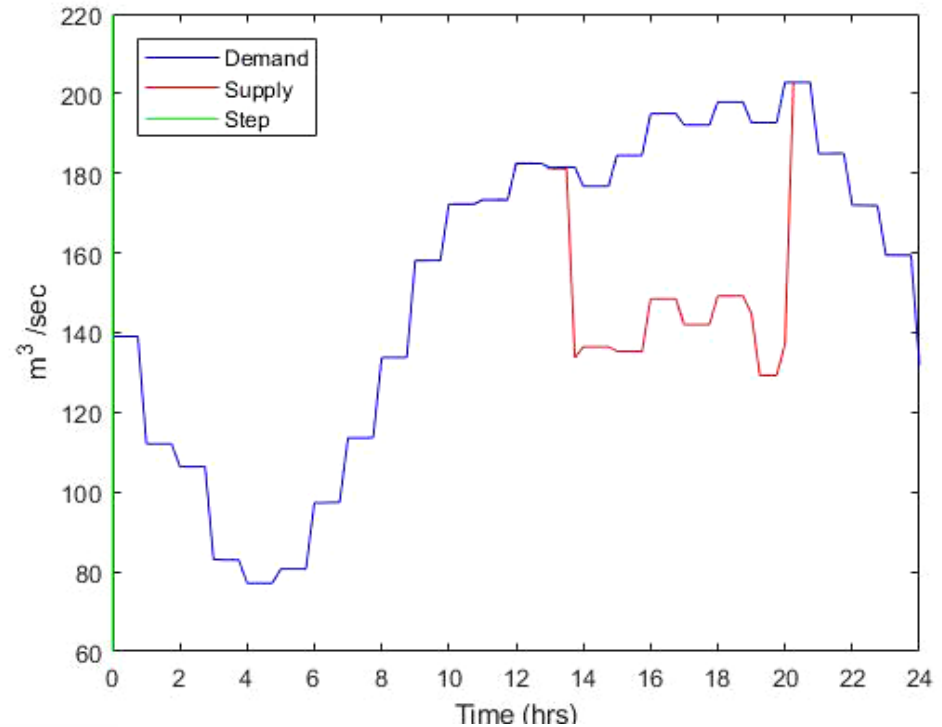
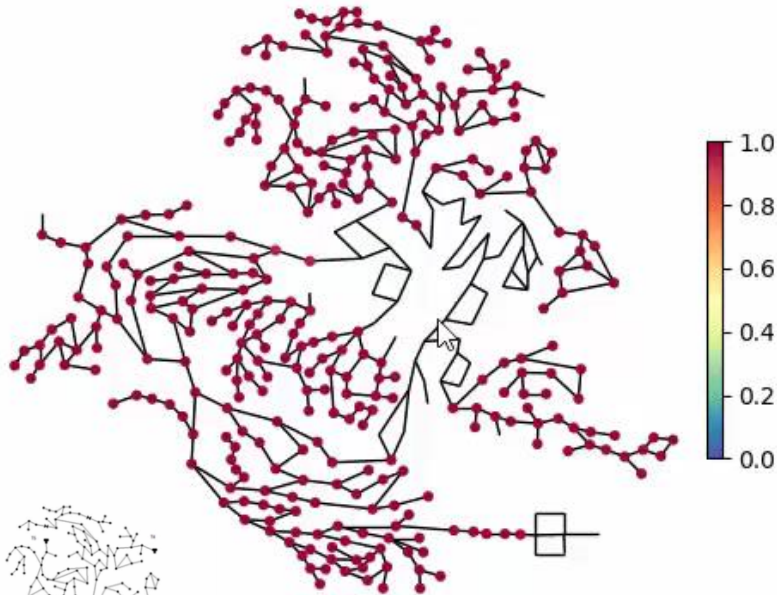
Users:

- ❑ Have access to a **number of available simulation tools** (for cyber & physical and desired levels of analysis)
- ❑ **Visualise the cyber network** on top of the **physical topology** of a real network and define its control logic
- ❑ **Link and simulate the combined cyber and physical system** (explicitly modelling interactions)  
e.g. simulate combined system (a) under normal conditions, (b) after incorporating a risk reduction measures, (c) under cyber-physical attacks (*denial-of-service, physical substance insertion into a node & sensor reading alterations*)
- ❑ **Choose** between Pressure-Driven-Analysis (**PDA**) & Demand-Driven-Analysis (**DDA**) for water **quantity** and **quality** issues
- ❑ **Assess system response** under the examined scenarios through **thematic maps** and **figures**
- ❑ **Compare impacts** from different scenarios by selecting specific **performance metric** and **KPIs**



# STOP-IT Stress-Testing Platform: RISKNOUGHT

Ratio of demand covered at time 00:00:00

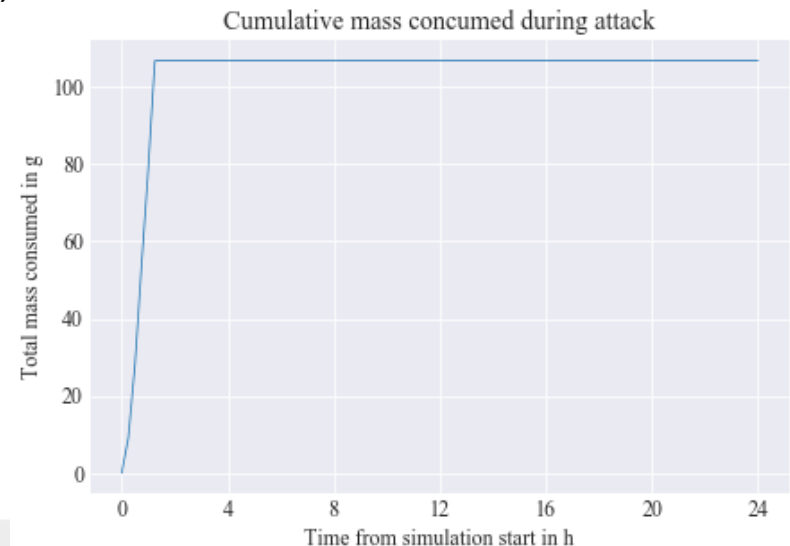
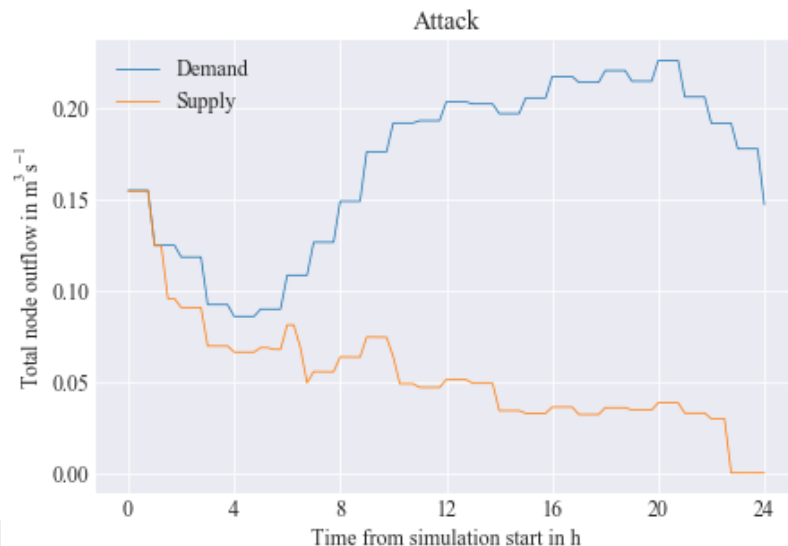


- **RISKNOUGHT** simulates the **flow of information within the cyber layer** (SCADA) and the **interconnection** with physical processes (hydraulic model)
- **Control logic** of the WDN is explicitly formulated
- **Hydraulics** are solved interactively with EPANET (using **PDA equations**)



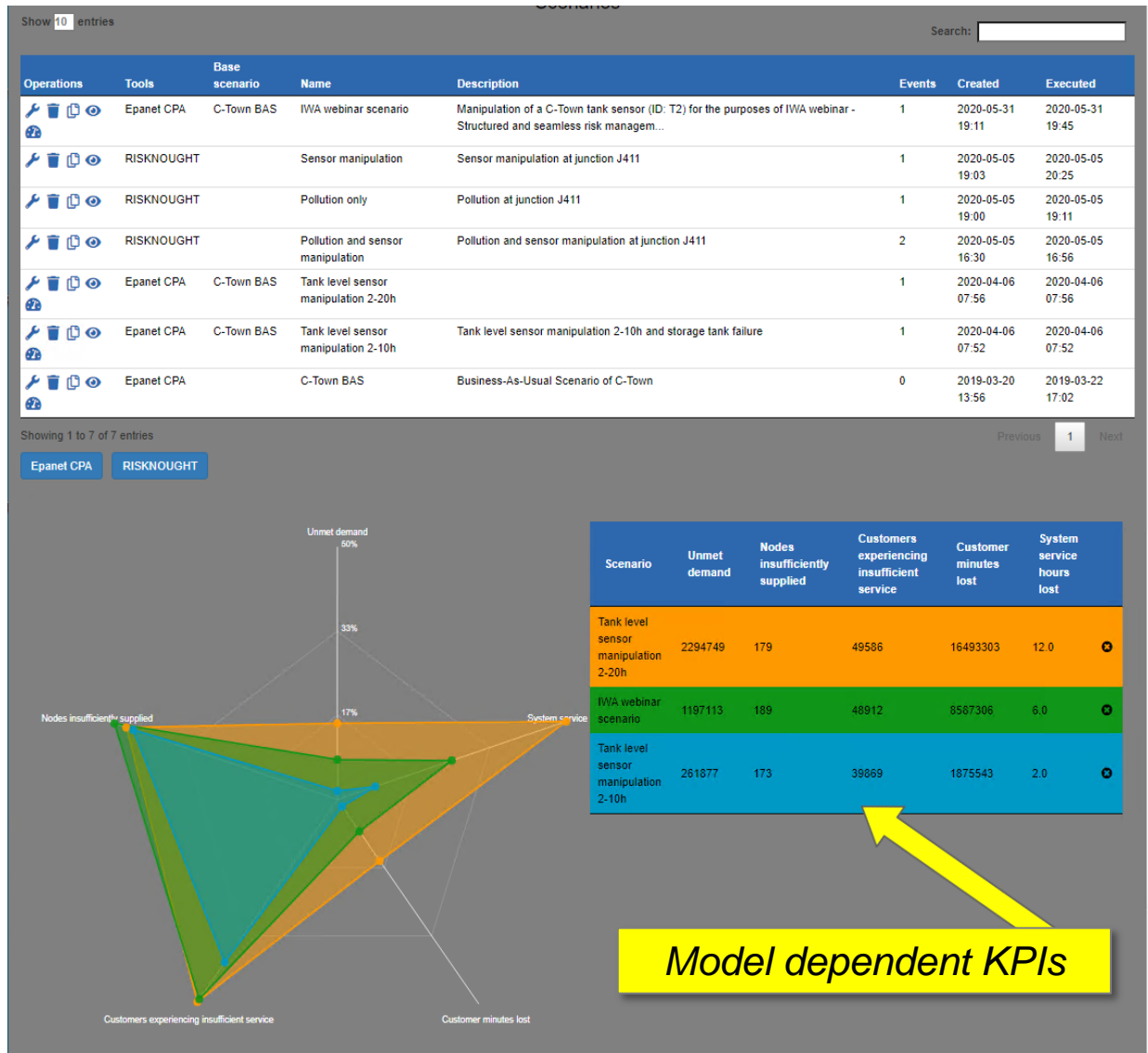
## New water quality simulation capabilities:

- ❑ Sensors can measure quality concentration indexes from coupled EPANET quality simulation
- ❑ Augments EPANET **control logic** by incorporating complex rules regarding quality monitoring:
  - Isolation of DMAs and PMAs
  - Main supply cut-off, cut-off supply from specific tanks
  - Activation of flushing units for contaminant removal
- ❑ Can model purely physical attacks (contaminant injection), cyber-attacks (false-positive contamination event by sensor manipulation) or combined cyber-physical attacks (contaminant injection and sensor manipulation)





# STOP-IT Scenario Planner: Comparing scenarios



✓ **Scenario Planner**  
**Identify** risks and  
build a network specific  
**threat scenario**

✓ **Stress Test Platform**  
**Simulate** the scenario

❑ **KPI tool**  
**Evaluate** the scenario  
consequences

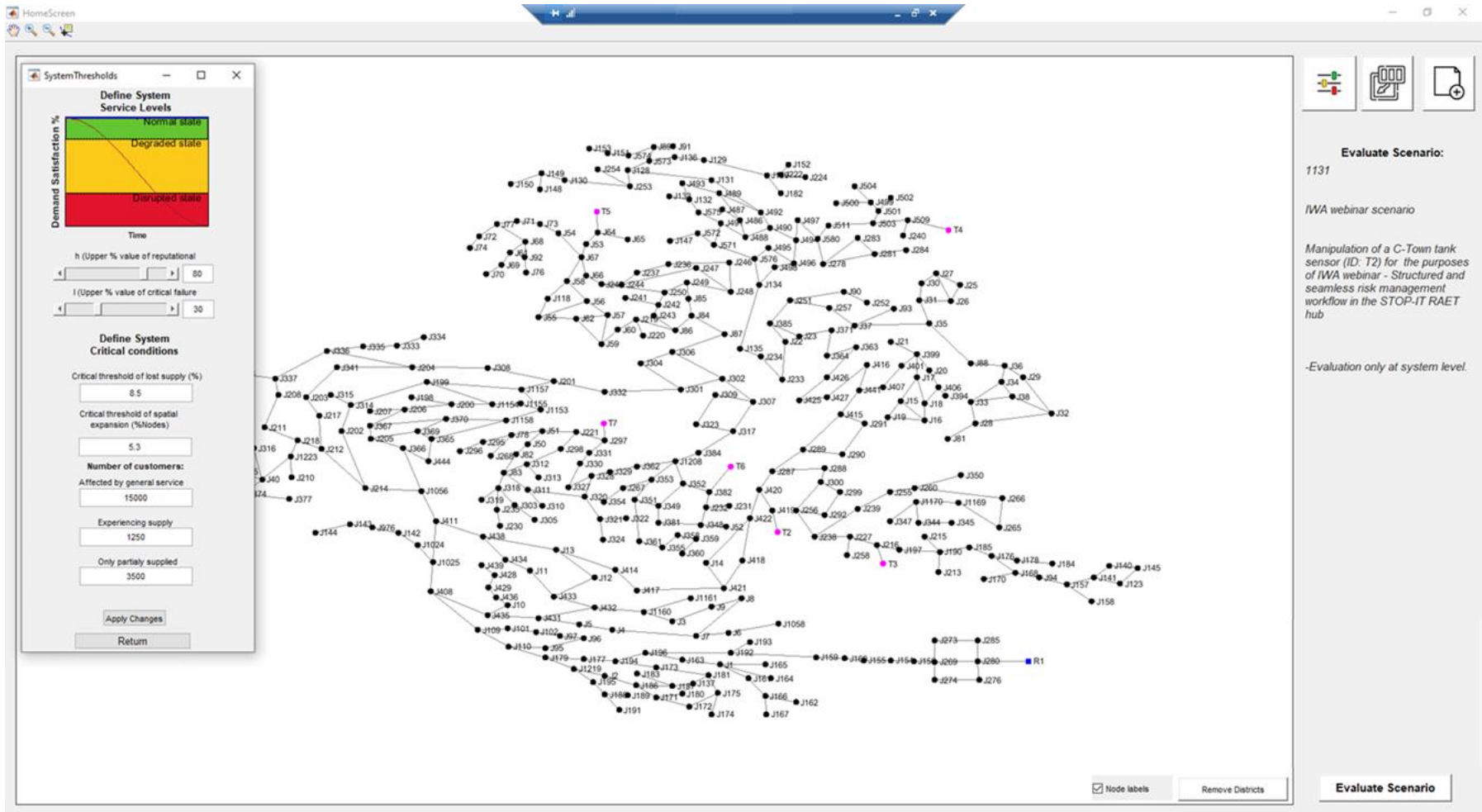


❑ **Scenario Planner**  
Explore appropriate  
**treatment** options



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# KPI tool: Assessment and detailed visualisation of results



Users can:

- ❑ can set the **service levels** for **different districts** & different thresholds for **critical customers**
- ❑ Visualise results and STOP-IT KPIs for any grouping they choose (DMAs etc.)



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# KPI tool: Interactive dashboard to assess and evaluate

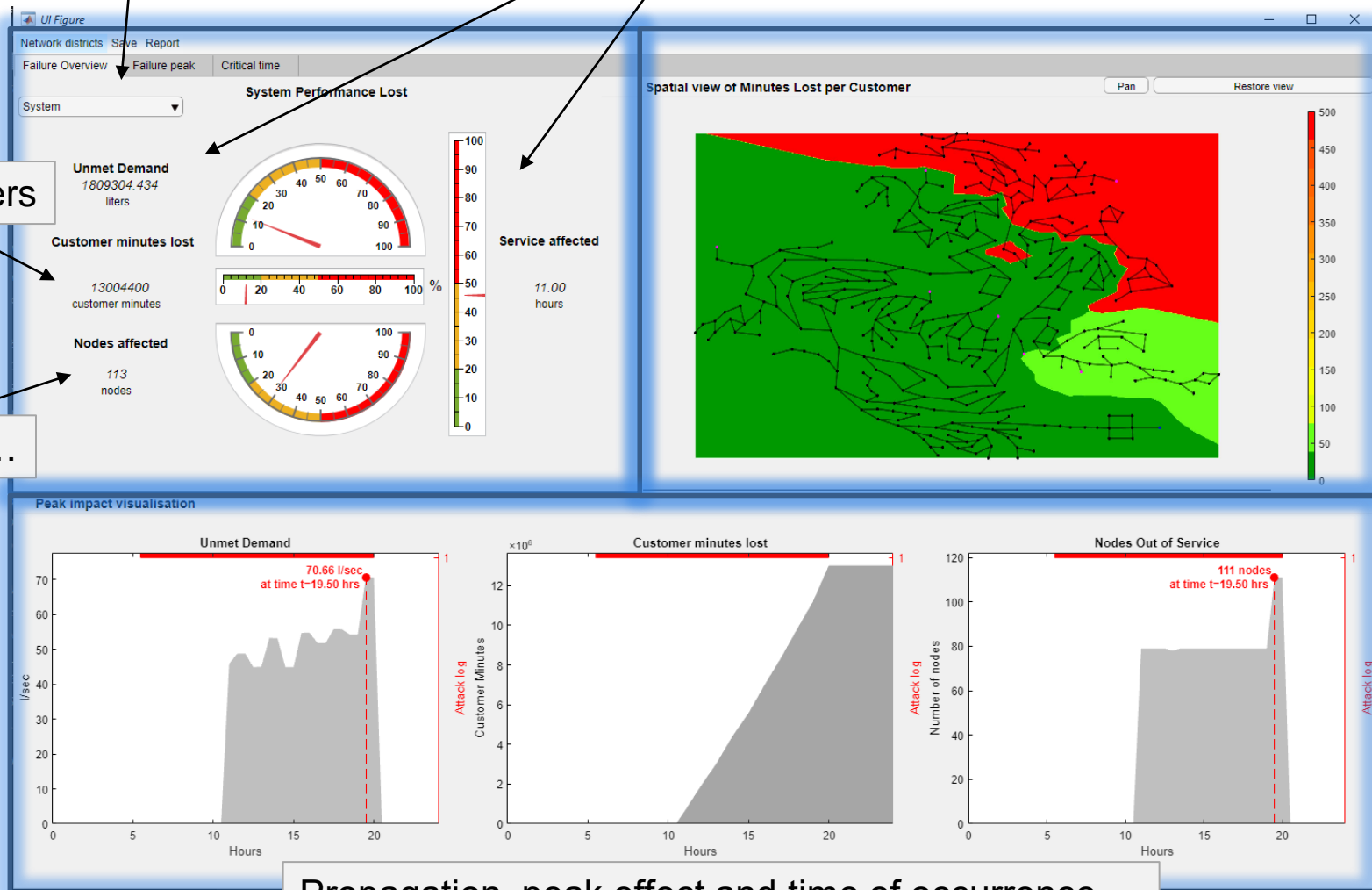
For the system.. Or each district

Supply...

Time

Customers

Nodes...

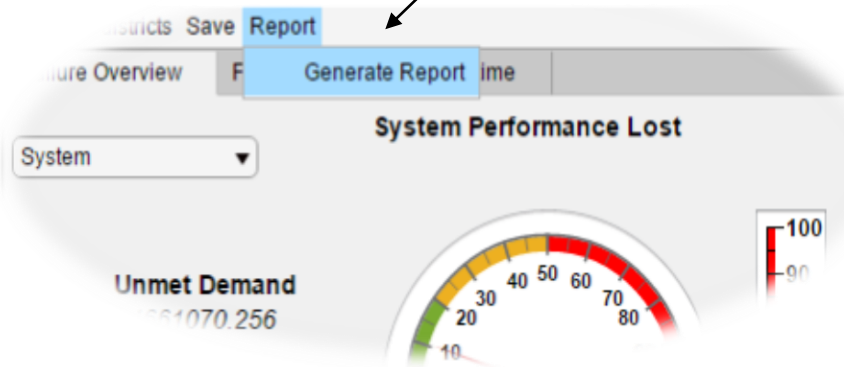


Propagation, peak effect and time of occurrence...



# STOP-IT KPI tool: Generating risk analysis reports

## Generate Risk Analysis Report



Fully automated report generation  
with a push of a button...

- Report *System* and *DMA* level Information in rich text
- Support Risk communication & Management documentation
- Metadata included for integrity and quality check
- Content can be **tailored** to utility's preferences

## Risk Analysis Report Scenario 1



# STOP-IT

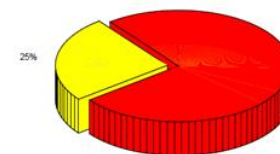
Gemorait  
DESKTOP-8POOIC  
11 Jun 2019 15:01

## Chapter 1. System Level

### 1.1. Overview

System failed to deliver 2041236.341 liters (13.39% of the total demand) in a service period of 24.00 hrs. 2036798.512 liters were not delivered due to complete service interruption and 2355.754 liters from partial inadequacy.

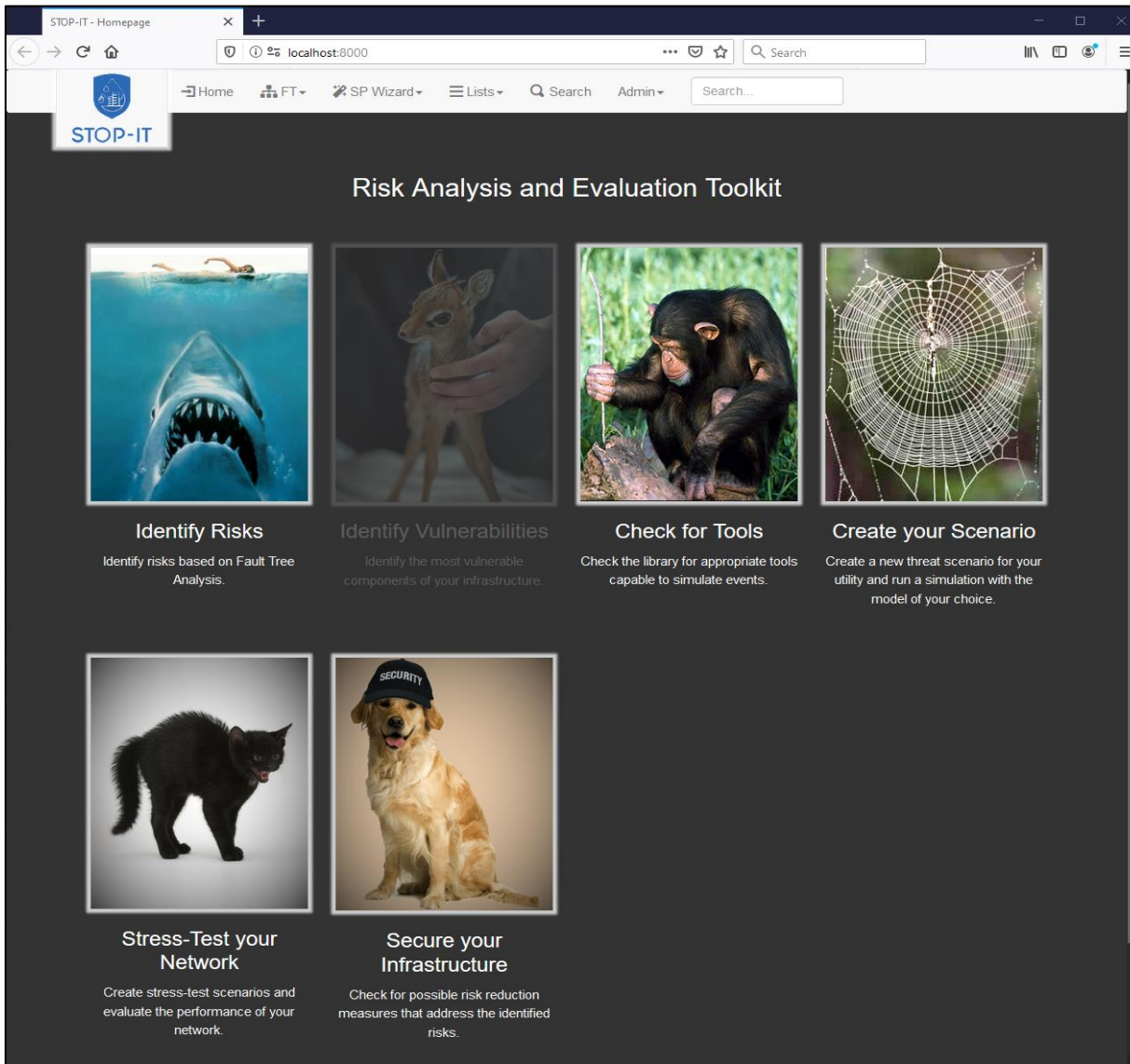
Total unmet demand per service level



Partial Inadequacy Service Interruption

29.38% of the system was affected (114 network nodes), with 111 supply nodes experiencing service cut-off and 3 experiencing partial demand satisfaction (28.61% & 0.77% respectively) during the service period.

This service failure affected totally 32976 customers. 32933 customers of which experienced supply interruption and 43 customers experienced service inadequacy. The system was affected for 16.00 hrs(66.67%), with 11.00 hrs of supply cut-off, and 16.00 hrs of supply inadequacy in the network. For the entire network, the system lost 14692920.0 customer minutes. Secondary, reputational customer minutes from partial supply were 17700.0 customer minutes.



## ✓ Scenario Planner

**Identify** risks and build a network specific **threat scenario**

## ✓ Stress Test Platform

**Simulate** the scenario

## ✓ KPI tool

**Evaluate** the scenario consequences

## ❑ Scenario Planner

Explore appropriate **treatment** options





# STOP-IT Scenario Planner: Incorporating measures

Measures					
Show 10 entries					
Advanced Search Reassess relations					
Search:					
Measure ID	Name	Description	Comments	Terms and Keywords	Risk reduction mechanism
M51	PressureAndFlowSensors	Installation of pressure and flow sensors at different positions in the water distribution network. Thus it can be checked if ...	With this network destruct		
M52	SecureLocks	Installation of secure locks. Thus the picking of locks is substantially complicated. The aim is to prevent that attackers can ...			
M53	LevelSensors	Installation of sensors indicating the filling level of storage tanks or additive reservoirs. Thus it can be supervised if any ...			
M54	ValvePositionSensors	Installation of sensors indicating the position of valves. Thus it can be checked if all valves are in the ...			
M55	PlausibilityChecks	Realization of automatic or manual plausibility checks of different operating and quality parameters. Thus contradictions in different signals can be ...			
M56	OperatingParameterSurveillance	Surveillance of operating parameters from the catchment to the final distribution point. Thus any damages, malfunctions or manipulations in the ...	Potential volume t different losses ...		
M30	EmployeesTrainings	Regular trainings, seminars, updates or similar on security issues should be implemented for all employees. Thus the staff is always ...			

*GUI of SP: navigating through the measures available in the RRMD*

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Home FT SP Wizard Lists Search Admin

Structured search page

Measure

Event

Name (String)

Description (String)

bookmarked

Probability (Range of real)

fault tree

Parents

asset type

event type

Scenario

Name (String)

Description (String)

created (Date)

executed (Date)

Is running

Event Scenario

You are searching for Measures related with Events having fault tree STOP-IT Quantity FT having asset type Sensor having event type Manipulation related with Scenarios having Name IWA webinar scenario having no Is running

21 items found

Cancel Show me

*GUI of SP supporting multiple filtering capabilities*

***Incorporating measure(s) into scenarios and assessing their impact to system's performance***



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# Matching Risks with Potential Risk Reduction Measures

Main event characteristics

Matching attributes, common in RIDB and RRMD

Models & Tools capable to simulate events

ID	Name	Description	Direct Consequence	Node	Fault Tree	Asset Type	Event Type	Asset Category	Threat Categories	Event Source Types	Event Consequences	Related tools	Event supported by RAET	Risk Reduction Measures
5271	Gate 96	Contamination from farming activities	Groundwater contamination	Intermediate	STOP-IT Water Quality FT	Groundwater	Pollution	Catchment Area	Physical	Human fault	Quality	Epanet MSX RISKNOUGHT	RISKNOUGHT	14
5161	Basic Event 27	Serious spill from interdependent Industry CI accident	Industrial activities and waste disposal failure	Basic	STOP-IT Quantity FT	Surface Water	Pollution	Catchment Area Raw Water Bodies	Physical	Human fault Interdependent CI	Quantity	Epanet MSX RISKNOUGHT	RISKNOUGHT	15
5199	Basic Event 33	Pesticide seepage to groundwater catchment	Contamination from farming activities	Basic	STOP-IT Quantity FT	Groundwater	Pollution	Catchment Area Raw Water Bodies	Physical	Human fault	Quantity	Epanet MSX RISKNOUGHT	RISKNOUGHT	12
5200	Basic Event 34	Nutrient pollution of groundwater catchment	Contamination from farming activities	Basic	STOP-IT Quantity FT	Groundwater	Pollution	Catchment Area Raw Water Bodies	Physical	Human fault Natural phenomena	Quantity	Epanet MSX RISKNOUGHT	RISKNOUGHT	12
5162	Basic Event 28	Illegal disposal practices from interdependent Industry CI	Industrial activities and waste disposal failure	Basic	STOP-IT Quantity FT	Surface Water	Pollution	Catchment Area Raw Water Bodies	Physical	Interdependent CI	Quantity	Epanet MSX RISKNOUGHT	RISKNOUGHT	7
5198	Basic Event 36	Seepage of Interdependent Industry CI waste to groundwater catchment	Groundwater contamination	Basic	STOP-IT Quantity FT	Groundwater	Pollution	Catchment Area Raw Water Bodies	Physical	Interdependent CI	Quantity			
5160	Basic Event 26	Serious spill from Interdependent Industry CI from cyber-physical attack	Industrial activities and waste disposal failure	Basic	STOP-IT Quantity FT	Surface Water	Pollution	Catchment Area Raw Water Bodies	Physical Cyber-Physical	Interdependent CI	Quantity			
5065	Gate 190	Surface water system mismanagement	Unavailability from reservoir	Intermediate	STOP-IT Quantity FT	Control System	Manipulation	Catchment Area Raw Water Bodies Water Abstraction Points			Quantity			
5066	Gate 191	Mislead surface water management system	Surface water system mismanagement	Intermediate	STOP-IT Quantity FT	Control System	Manipulation	Catchment Area Raw Water Bodies Water Abstraction Points		External attacker Internal attacker Human fault	Quantity			
5064	Gate 155	Unavailability from reservoir	Unavailability from surface catchment area	Intermediate	STOP-IT Quantity FT	Surface Water	Interruption	Catchment Area Raw Water Bodies Water Abstraction Points			Quantity			
5068	Gate 193	Surface water management system functions on altered data	Mislead surface water management system	Intermediate	STOP-IT Quantity FT	Control System	Manipulation	Catchment Area Raw Water Bodies Water	Cyber Cyber-Physical	External attacker Internal attacker	Quantity			

Number of potential RRM

List of RRM

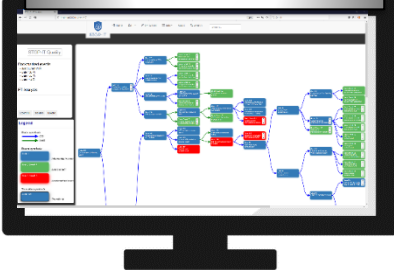
Show 10 entries

Search:

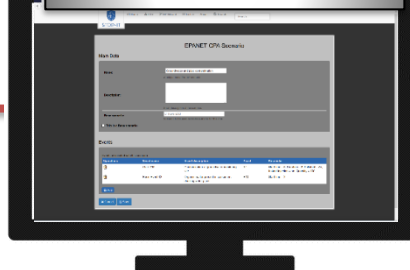
Measure ID	Name	Description	Comments	Terms and Keywords	Risk reduction mechanism
M12	SupervisionOfExternals	Supervision of any external people entering the water utility or sensitive sites. Any people who enter sites and who are ...			Frequency/Likelihood
M16	SourceWaterQualityControl	Control of raw water quality. The aim is to control the raw water quality in order to select the best ...			Frequency/Likelihood & Consequences
M19	FiltersInAerationProcesses	All air for aeration purposes in water treatment plants and water storage tanks should be filtered. Thus it is aimed ...	Filters should be installed at every air intake for aeration purposes. Furthermore, no openings for aeration purposes should be built ...		Frequency/Likelihood
M27	EmployeesTrainings	Regular trainings, seminars, updates and informations on security issues should be implemented for all employees. Thus the staff is always ...			Frequency/Likelihood & Consequences
M29	EmergencyPlans	Setting up of emergency plans. Thus clear responsibilities, courses of action, procedures and contacts are defined and documented for emergency ...	A complete crisis plan should exist including responsibilities, pending tasks, important contacts etc. All tasks from the evaluation of the ...		Consequences
M30	RedundantAssetsAndInfrastructures	Constructions of redundant infrastructures and assets along the whole water supply chain. Thus the failure of one component can, at ...	Redundant infrastructures could exist in the water extraction (wells, river extractions, reservoir extractions, spring water), water treatment infrastructures (filtration, adsorption, ...		Consequences
M33	AdditionalStorageCapacity	Construction of additional storage tanks. Thus periods of water scarcity can be bridged easier due to a higher amount of ...			Consequences



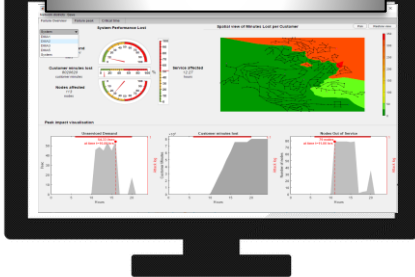
Navigate through risks



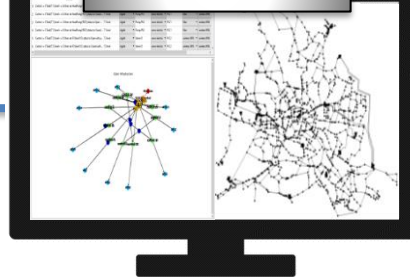
Configure scenario(s)



Evaluate simulations



Run simulations

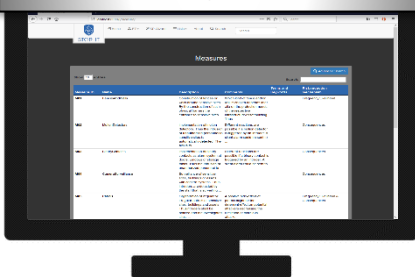


✓ **Scenario Planner**  
**Identify** risks and  
build a network specific  
**threat scenario**

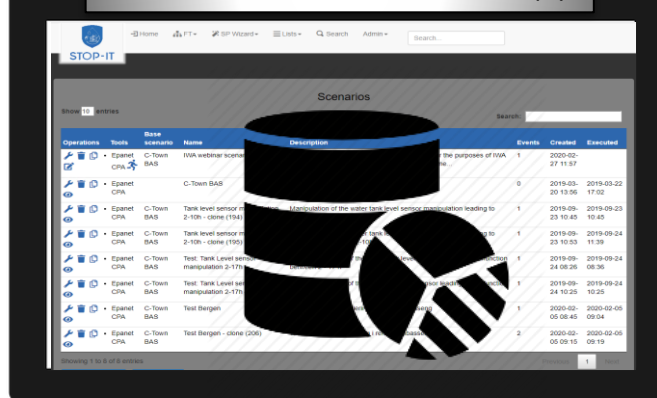
✓ **Stress Test Platform**  
**Simulate** the scenario

✓ **KPI tool**  
**Evaluate** the scenario  
consequences

Explore mitigation options



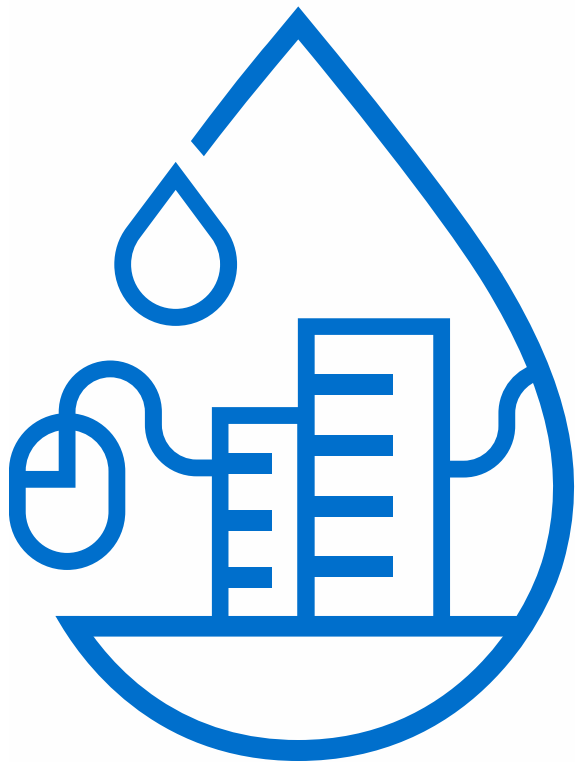
RAET archive of scenario(s)



✓ **Scenario Planner**  
Explore appropriate  
**treatment** options



STOP-IT



STOP-IT

**THANK YOU FOR YOUR  
ATTENTION**

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