

Asset Management Advisory Services to Water Utilities in South-Eastern Europe (SEE AM)



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Methodologies & Tools For Integrated Asset Management A cloud based solution



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Asset Management Advisory Services to Water Utilities in SEE

Introduction of SEEAM Program



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Agenda

-  STA-IAM Program Description
-  Stage I -Demonstration / Examples
-  Summary - Program Benefits



Introduction

Program Objective

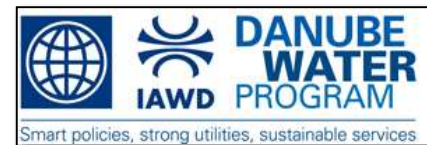


The main purpose of the program is to enable Hub-Centres to provide capacity building to the participating Utilities to carry out Integrated Asset Management (IAM) activities through training, support and the provision of appropriate software and best-practice methodologies.

SEE AM Program Partnership & Structure



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Strategic Alliance for Integrated
Asset Management (STA-IAM)



**Asset Management Advisory Services to
Water Utilities in South-Eastern Europe**



Program Partnership



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Asset Management Advisory Services to Water Utilities in South-Eastern Europe



Membership Agreement
EDAMS License Contract

Membership Agreement
EDAMS License Contract



Advisory Board
GIZ, HCE, IAWD, UTVSI, Aquasan, ADKOM (MK), WSWAM (MN), UPFBiH & ARSW (B&H), SHUKOS (KS), SHUKALB (AL), KfW, SECO



Asset Management Advisory Services to Water Utilities in SEE

Introduction of SEEAM Program



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Program Description

Services to be provided

Senior staff from each participating utility will receive services that include:

-  **Workshops/Conferences:** Will be held on a regular basis presenting various aspects of the services and IAM.
-  **Data Conversion & IAM Systems Implementation:** The EDAMS IAM software will be provided to each Utility and will be hosted and operated through the Cloud.
-  **Classroom Training:** Training courses will be held at the Hub premises on a regular basis addressing all aspects of IAM with different courses applying for the different stages of the program.
-  **Visits:** Utilities are encouraged to visit the Hub in regular intervals to seek advice and assistance.
-  **Support:** Daily Remote support to Utilities in the use of the software and procedures adopted.
-  **Access to Additional IAM Services:** Will be provided if required optional at an extra cost to assist the Utilities with studies, such as the compilation of a Commercial Rehabilitation Plan, an Investment Plan, a Rehabilitation & Maintenance Plan and Infrastructure Plans.

Asset Management Advisory Services to Water Utilities in SEE

Introduction of SEEM Program

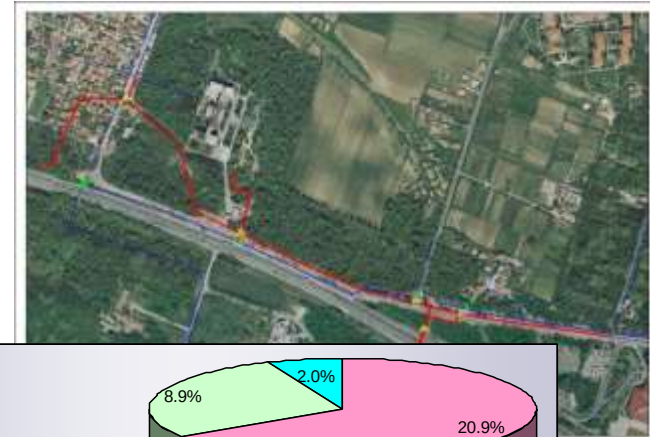


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Operational System with embedded IAM Best Practices

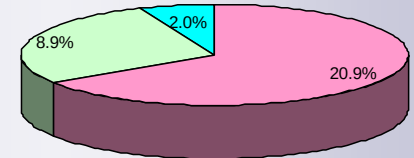
Technical Department's IAM System

- Water/Waste Water Quality Management
- Zoning Management
- Financial Assets Management
- Projects Register Management
- Metering Management
- Demand/Water Audits Management
- Engineering Design/Analysis support
- Web Enabled



**Non-Revenue
Water breakdown**

- Real Losses (leakage)
- Apparent Losses (commercial losses)
- Payment Losses (Non-payment)



Program Description

Training Programs



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No.	Stage/ Package	Training Course
1	Stage 1 - Silver package	GIS/ Network Data Management
2		Advanced GIS/ Network Data Management
3		Maintenance Management
4	Stage 2 - Gold package	Advanced Maintenance Management
5		Commercial Data Management
6		Distribution/ NRW Management
7		Water Quality Management
8		Rehabilitation Planning
9		Infrastructure Planning



Training courses will be held on a regular basis addressing all aspects of IAM with different courses applying for the different stages of the program.



Participation costs are subsidized. Training for Public Utilities will be undertaken both by the Associations as well as Hydro-Comp.



Hydro-Comp has already prepared detailed training material covering all aspects of Integrated Asset Management, through the use of the tools and procedures adopted.

Program Description

Data Protection & Distribution



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Cloud solution provides major benefits for Utilities, i.e.:

- Better utilization of resources.
- Frees administrative resources by outsourcing non-core applications
- Reduces IT capital requirements with an elastic pay-as-you-go operating expense model
- Improves data protection with affordable backup and disaster recovery



The EDAMS Software and Utilities databases will be hosted on Amazon Elastic Compute Cloud (Amazon EC2) servers.

Stage I > Setting Up of Cloud Assess Utility Cloud Space– 30GB



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APPSEEAM - SEEAM.edams.com - Remote Desktop Connection

Recycle Bin test

Database Manager 5.1

Google Chrome

Network Asset Mana...

OpenVPN GUI

Open Utility Cloud Directory...

In GIS From Table Prompt

Meter Chamber

Active Element

File Data

- ☒ edams_t
- ☒ edams_v
- ☒ edams_v
- ☒ Saht
- ☒ edams_v
- ☒ edams_v
- ☒ edams_r
- ☒ edams_b
- ☒ edams_e
- ☒ Water Cl

Subotica

This PC > UtilitiesData (E:) > 04 Serbia > Subotica

Name	Date modified	Type	Size
Project files			
Project files			
Project files			
This PC			
Desktop			
Documents			
Downloads			
Music			
Pictures			
Videos			
Windows (C:)			
DATA (D:)			
UtilitiesData (E:)			
01 Bosnia & He			
02 Macedonia			
03 Montenegro			
04 Serbia			
Arandjelovac			
Dorji Milane			
Gornji Milanc			
Indija			

10 items

Asset Management Advisory Services to Water Utilities in SEE

Introduction of SEEAM Program in Utilities



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Stage I - Silver:

To assist Utilities in setting up and maintaining a validated network geographical database, effectively performing proper Network Data Management as well as understand components of Integrated Asset Management (AM).



Network Data Management



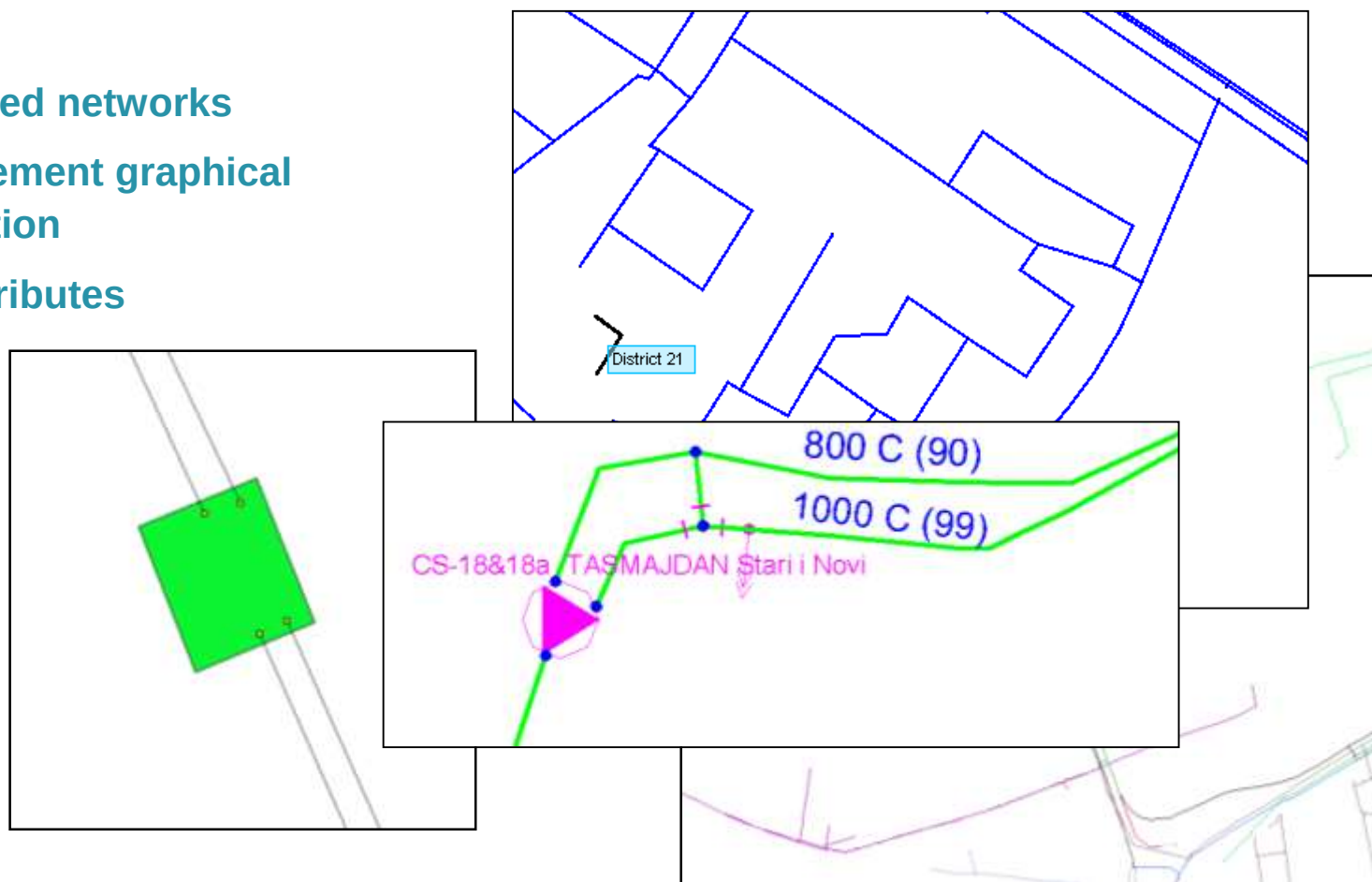


Stage I

Building a Network Asset Registry

From.....

- Disconnected networks
- Network element graphical representation
- Missing attributes



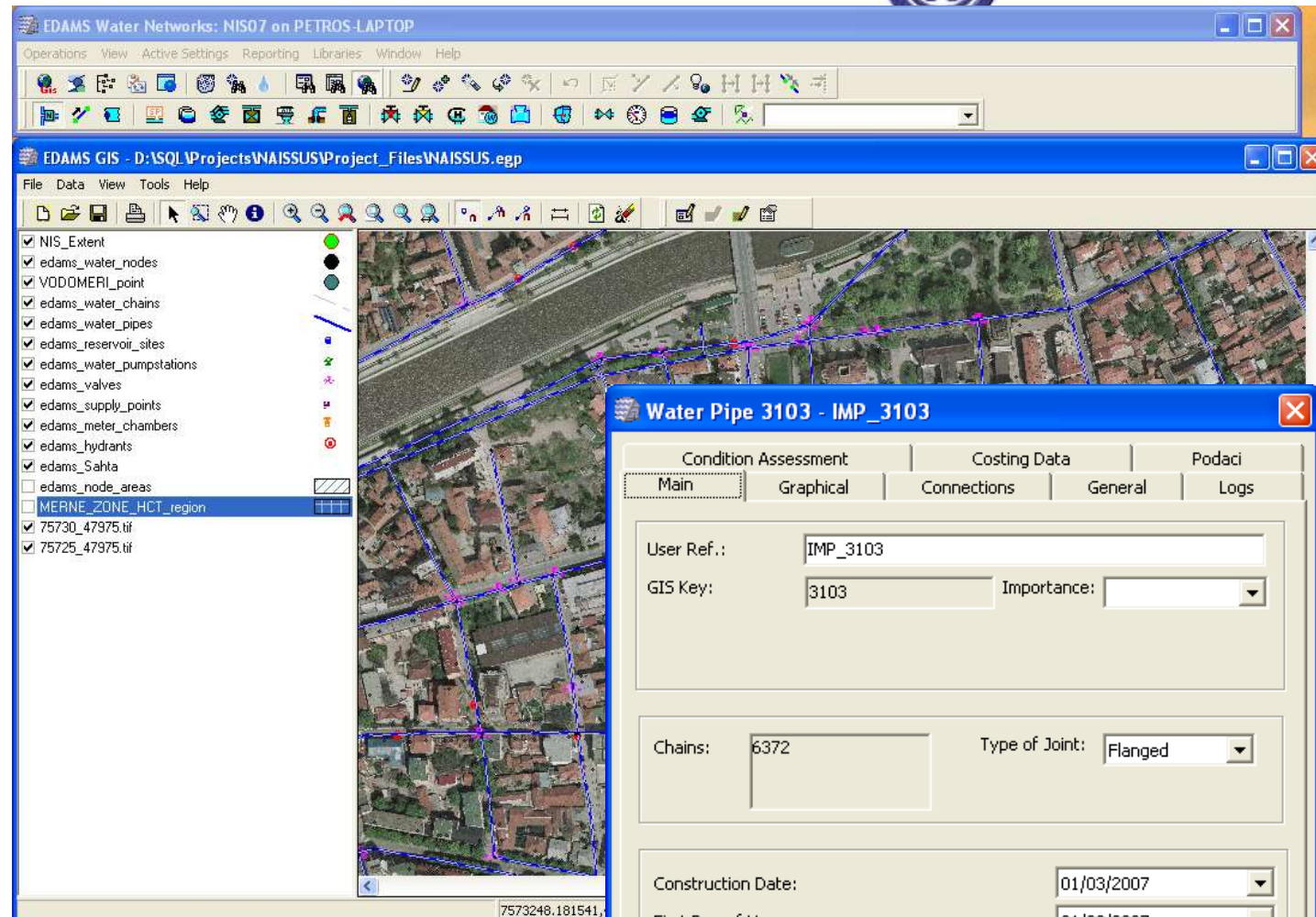
Stage I

Building a Network Asset Registry and full life cycle management of Network Assets

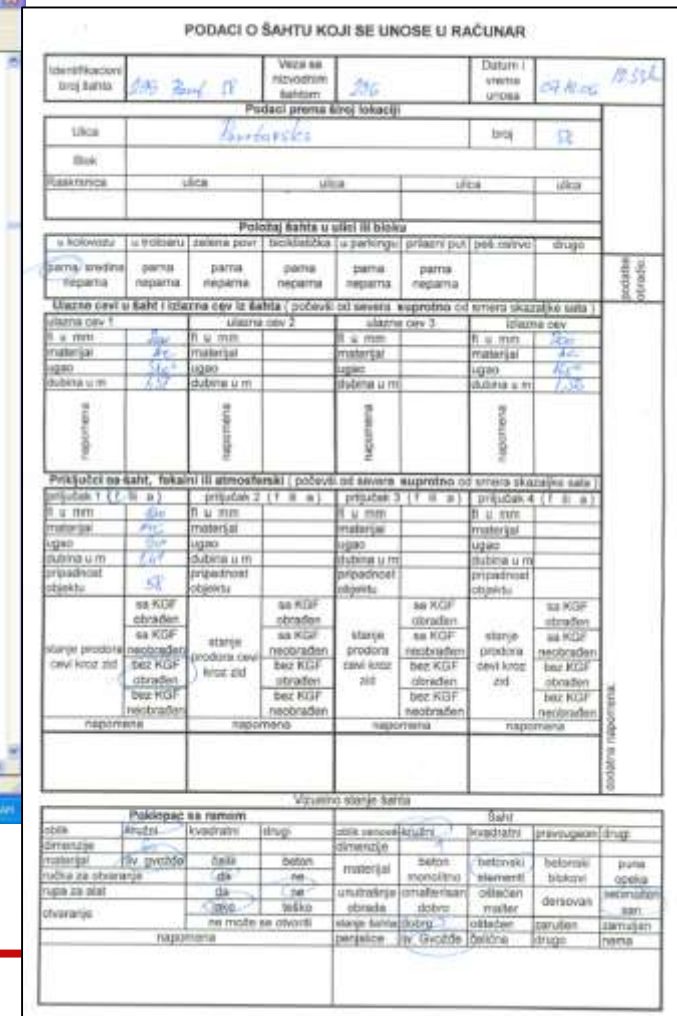


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- Water Node (Ctrl + N) Ctrl+N
- Water Chain (Ctrl + C) Ctrl+C
- Node Area
- Water Pipe (Ctrl + P) Ctrl+P
- Reservoir Site
- Water Pumpstation
- Ctrl Valve Chamber
- Valve
- Relief Device
- Supply Point
- Borehole Site
- Meter Chamber
- Hydrant
- Geo Water Connection
- Fitting
- Air Valve
- Water Treatment Plant
- Water Chamber
- Pressure Gauge
- Sampling Point
- Reservoir
- Water Pump
- Bulk Meter
- Control Valve
- Billing Connections



International Association
of Water Supply Companies
in the Danube River
Catchment Area



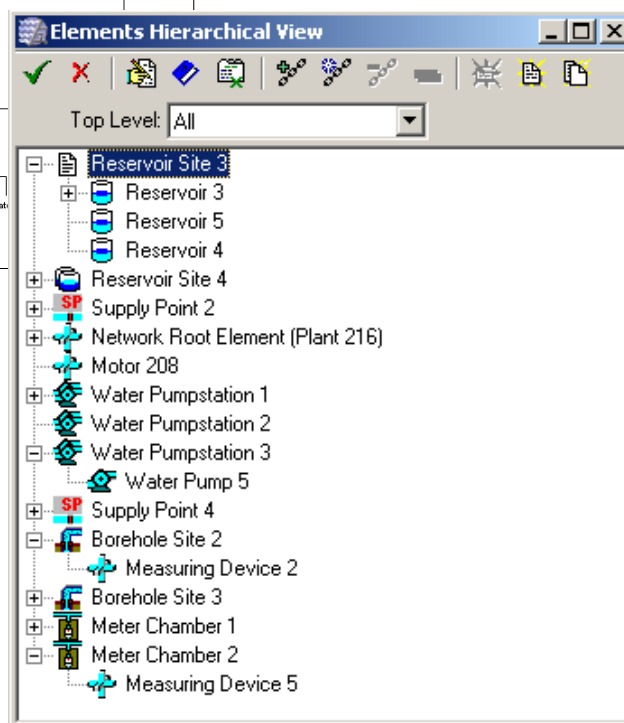
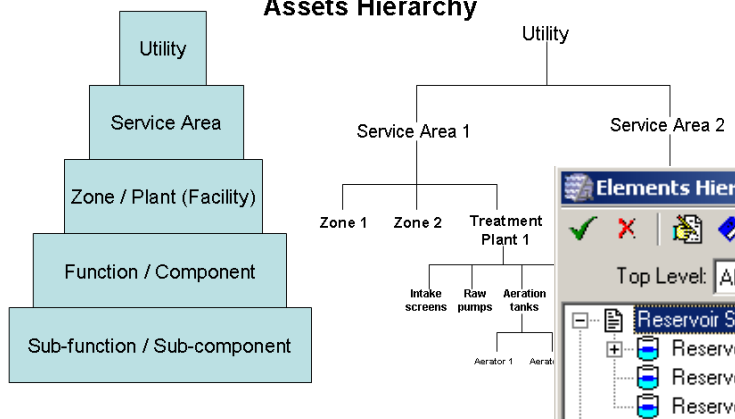
Stage I

Building a Network Asset Registry To Proper Hierarchical Component Management



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Assets Hierarchy



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Stage I - Silver:

To assist Utilities in setting up and maintaining a validated network geographical database, effectively performing proper Network Data Management as well as understand components of Integrated Asset Management (AM).

Stage II - Gold:

To enable (a) Maintenance Management for improving productivity and efficiency of the maintenance function and service delivery as well as for registering maintenance problems for further use in Rehabilitation/ Maintenance Planning (Stage III)



Network Data Management



Maintenance Management





- Computerisation of Maintenance function
- Call Centre/Customer Services
- Incidents Management
- Work Order Management
- Management Reporting
- Job Costing
- Budgeting
- Performance Indicators



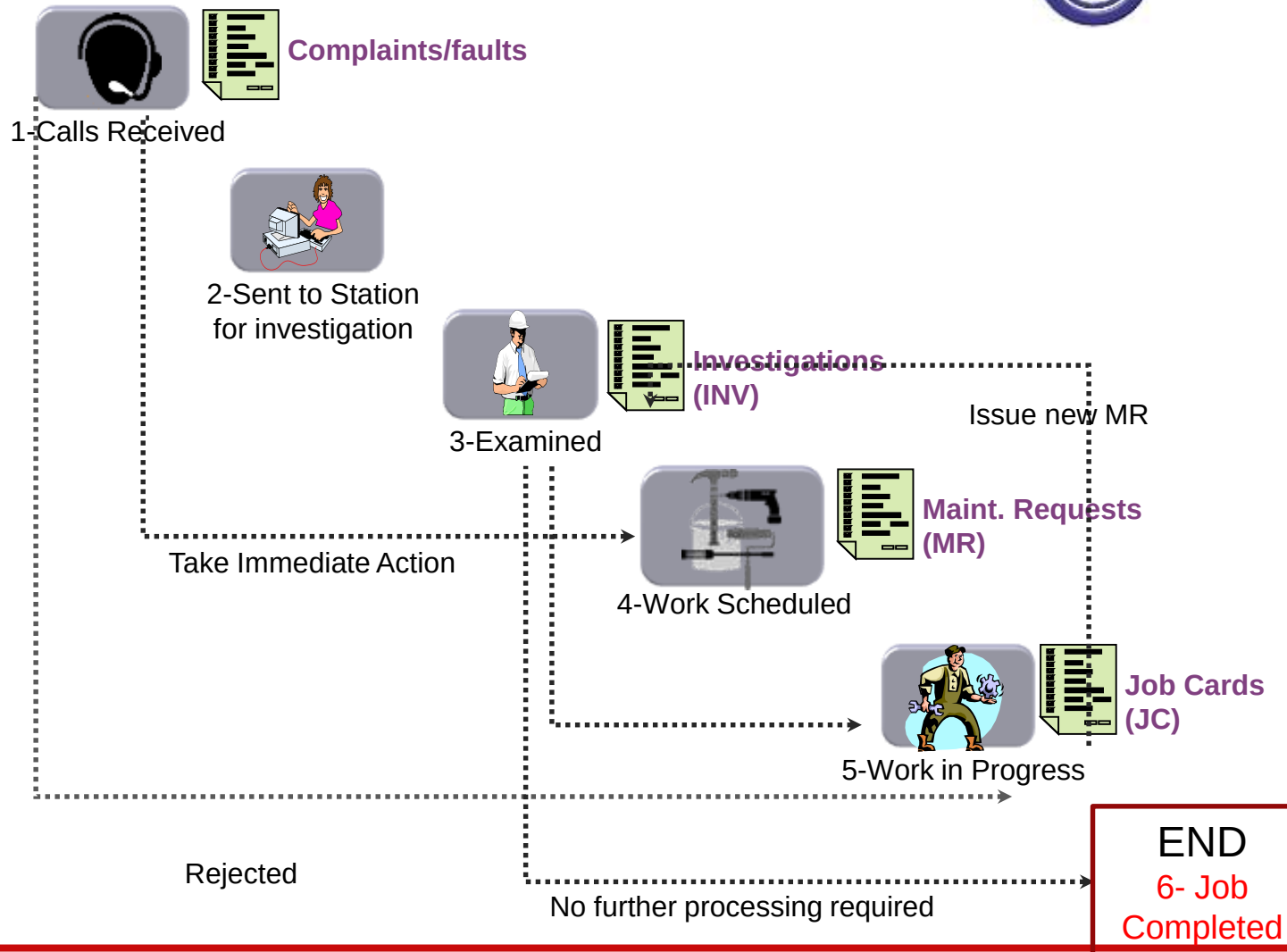
german
cooperation
INSTITUT FÜR ZUSAMMENARBEIT

Stage II: IAM Best Practices

Maintenance Management - Workflow



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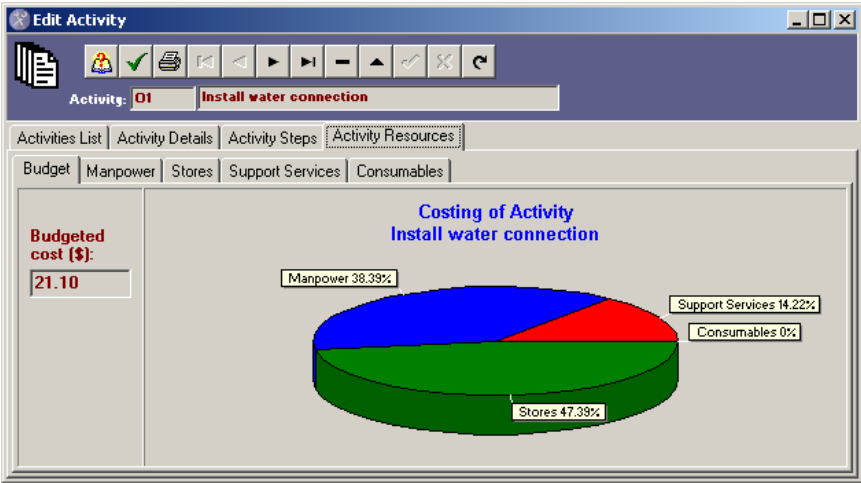
Introduction of SEEM Program

Stage II

Maintenance Management – Management Decision Support



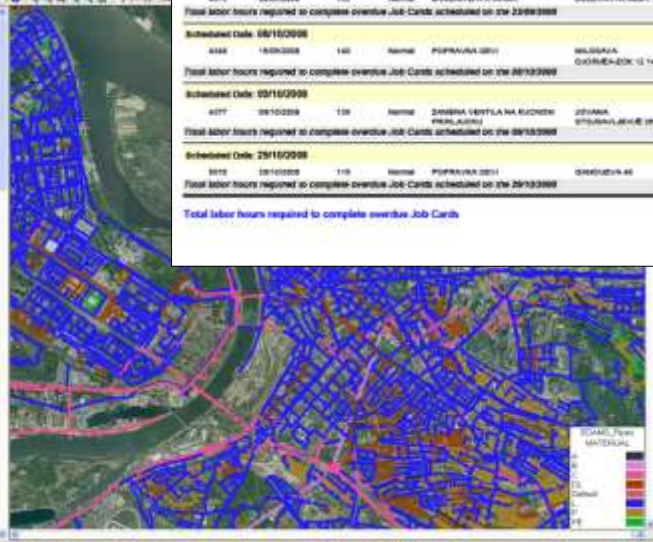
- Management Reporting
- Job Costing
- Budgeting
- Performance Indicators



Belgrade Water & Sewer Utility
Operations & Maintenance Reports
Scheduler of Planned Jobs

Date: 25/02/2009
Time: 17:17:54

JOB NO	Issued Date	Overdue (days)	Priority	Action to take	Problem Location	Comment	Planned Duration (hrs)
Scheduled Date: 21/06/2008							
800	26/06/2008	344	Normal	POPIVA/VA (GV)	KOSMAJSKI PARTOVNA 2	Water Pipe - 0	13.20
Total labor hours required to complete overdue Job Cards scheduled on the 25/02/2009							13.20
Scheduled Date: 21/07/2008							
1778	09/07/2008	209	Normal	POPIVA/VA (GV)	OSLUJEV VENAC 5	Water Pipe - 2.231	11.20
Total labor hours required to complete overdue Job Cards scheduled on the 21/07/2008							11.20
Scheduled Date: 01/08/2008							
1087	07/08/2008	202	Normal	POPIVA/VA (GV)	THOMIRA STANOVICA 10	Water Pipe - 0	13.20
Total labor hours required to complete overdue Job Cards scheduled on the 27/08/2008							13.20
Scheduled Date: 22/08/2008							
2485	01/09/2008	180	Normal	ZABRANA ZATVORAVANJA (SANTU)	SLUTINA BILANOVIKA 120	Water - 0	3.20
Total labor hours required to complete overdue Job Cards scheduled on the 22/08/2008							3.20
Scheduled Date: 26/08/2008							
2611	27/08/2008	175	Normal	ZABRANA ZATVORAVANJA	DR AGOSTINA NETA 42 58	Water - 0	3.20
Total labor hours required to complete overdue Job Cards scheduled on the 26/08/2008							3.20
Scheduled Date: 22/09/2008							
4078	22/09/2008	180	Normal	ZABRANA ZATVORAVANJA	BULEVAR ANDREA 100	Water - 0	3.20
Total labor hours required to complete overdue Job Cards scheduled on the 22/09/2008							3.20
Scheduled Date: 08/10/2008							
4148	18/09/2008	180	Normal	POPIVA/VA (GV)	WILGATA KORUJEVSKA 12 14	Water Pipe - 0	13.20
Total labor hours required to complete overdue Job Cards scheduled on the 08/10/2008							13.20
Scheduled Date: 09/10/2008							
4077	09/10/2008	110	Normal	ZABRANA VENTILACIJE NA KUCNIM (KUPALIŠTIMA)	STIVANA STIVANOVIC 28	Water Connection - 0	0.00
Total labor hours required to complete overdue Job Cards scheduled on the 09/10/2008							0.00
Scheduled Date: 28/10/2008							
5070	28/10/2008	110	Normal	POPIVA/VA (GV)	GRADJEVINA 40	Water Pipe - 0	13.20
Total labor hours required to complete overdue Job Cards scheduled on the 28/10/2008							13.20
Total labor hours required to complete overdue Job Cards							78.00



Stage II > Cloud Operations Monitoring & Reporting



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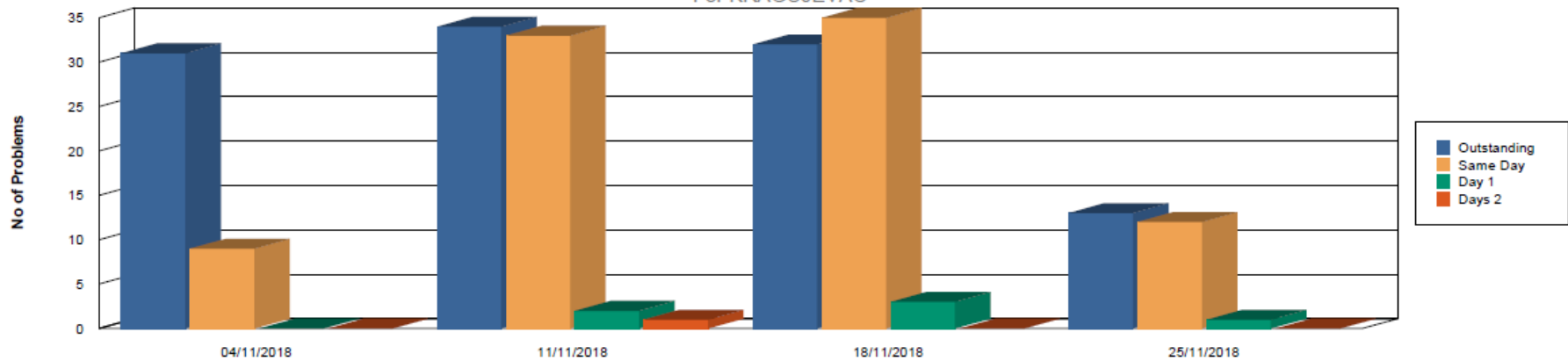
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Stage 2 Maintenance Management System Statistics Report



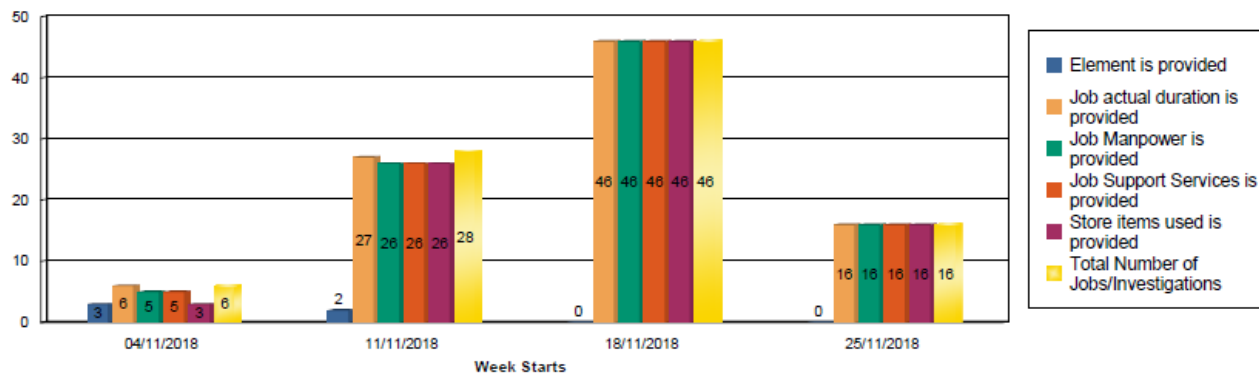
Response days Vs Problems

For KRAGUJEVAC



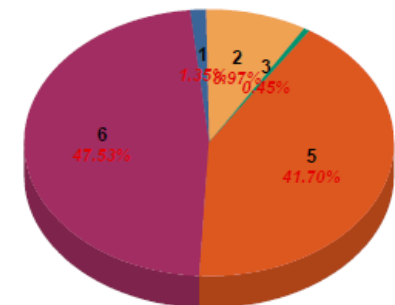
Job Card Completion - Weekly Check

For KRAGUJEVAC



MMS Statistics

For KRAGUJEVAC



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Stage II - Gold:

To enable (a) Maintenance Management for improving productivity and efficiency of the maintenance function and service delivery as well as for registering maintenance problems for further use in Rehabilitation/ Maintenance Planning (Stage III)



Stage I - Silver:

To assist Utilities in setting up and maintaining a validated network geographical database, effectively performing proper Network Data Management as well as understand components of Integrated Asset Management (AM).



Stage III - Platinum:

The last year's stage will enable operational activities of Integrated Asset Management namely: (a) Operations – Monitoring /Control and (e) Distribution Management



Network Data Management



Maintenance Management



Monitoring & Control /Operations



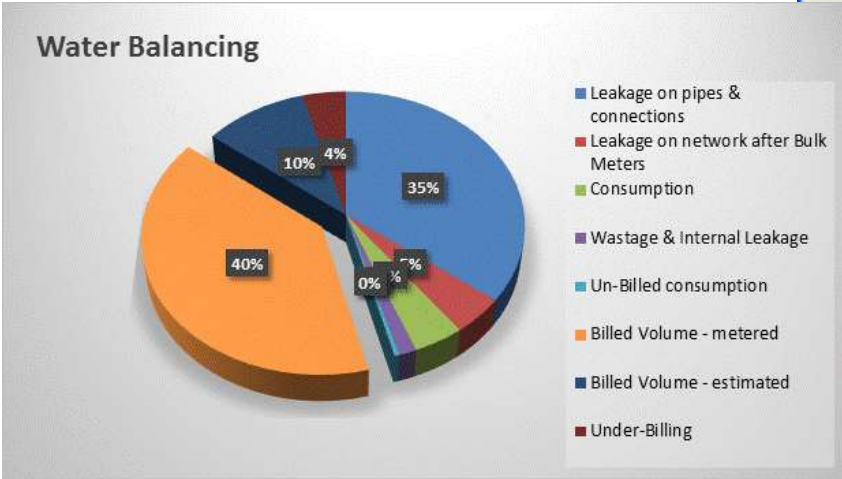
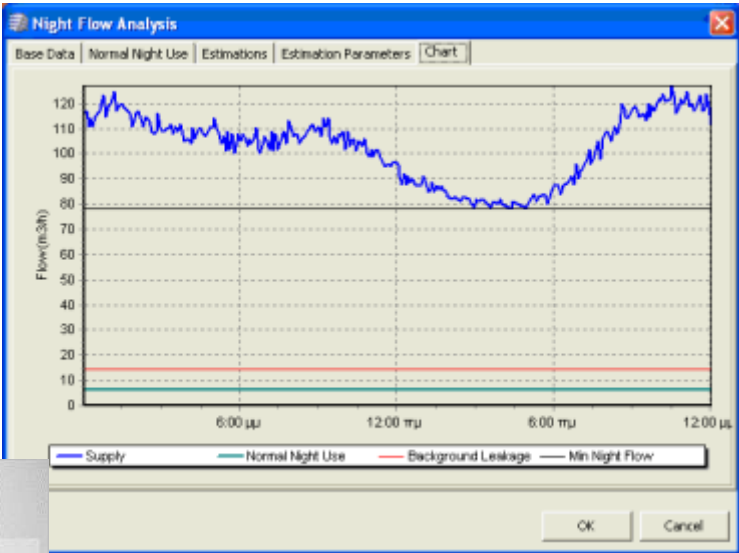
Distribution Management



Stage III
Distribution / NRW Management

Addressing Auditing & Balancing including:

- DMA Management/Operation
- Balancing-Top down
- Water Balancing-Bottom up
- Consumption Analysis

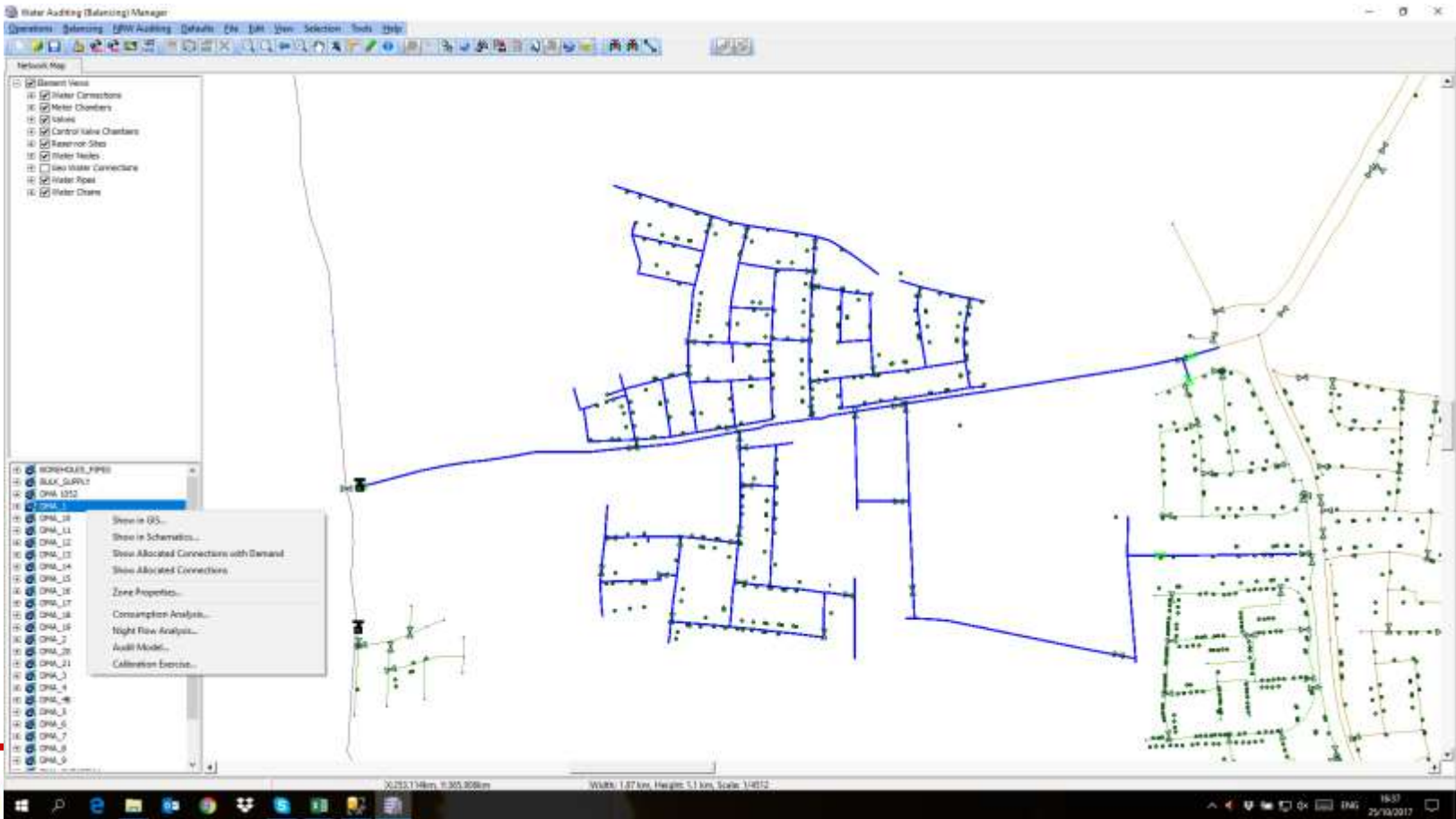




Stage III: Distribution Management

Consumption Analysis

Meter flow generation / flow aggregation per DMA (averages)



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Stage III: Distribution Management

Leakage Analysis & Mass Balancing

Analysis of Minimum Night Flow (MNF) Historical Pattern per DMA

Analysis Period

Period Start: 23/05/2017
Period End: 20/09/2017

Analyse MNF History for the period*

MNF Trend Alarm Threshold, %: 5

* Excluded Zones with chambers with no meters or meters with no readings in at least one chamber

☐ Remove time-series outliers ☐ Zones Excluded

Summary MNF Statistics

MNF Summary Stats	Unit	Value
Network Length	km	47.4
No of Service Connections		3705
No of MNF found		66
Latest MNF - Value	m3/hr	44.2
Latest MNF - Date	Date/time	27/07/2017
Last 7 days - Avg MNF	m3/hr	46.9
Last 30 days - Avg MNF	m3/hr	46.7
Period Stats - Min MNF	m3/hr	29.0
Period Stats - Max. MNF	m3/hr	67.1
Period Stats - MNF Trend	%	6.6

Selected Zone MNF Analysis

Balancing (Top/Down Approach)

Zone Type: District DMA
Period: User Defined
User Definable period: From: 20/09/2016 To: 20/09/2017
Period Length: 366 days

UFW Calculation Option:
☒ Use only Metered Supply & Consumption Records
☐ Use Corrected/Calculated Supply & Consumption

Analysis Type:
☐ Balancing / UFW
☒ Leakage Indices

Zone Id	Name	Avg. Supply Flow (m3/day)	Apparent Losses (m3/day)	UFW (m3/day)	UFW per network length (m3/day/km)	UFW per connection (m3/day/conn)	Avg. Zone Pressure (m)	Connections Density (conn/km)	CARL (m3/day)	CARL (m3/day/km)	TIRL (l/day/conn)	UIARL (l/day/conn)	UIARL (m3/day)	SLI
A - DMA zones that can balance (+ve balance)														
925	DMA_1	157.1	7.9	39.1	4.20	0.10	50	43.02	31.2	3.4	76.6	61	24.7	1.3
835	DMA_10	533.0	26.6	12.6	0.52	0.01	50	77.12	-14.3	-0.6	-7.8	52	94.6	-0.2
838	DMA_11	1376.6	68.8	411.4	8.67	0.11	50	78.12	342.6	7.2	92.5	52	150.9	1.8
930	DMA_12	232.3	11.8	134.0	31.94	1.44	50	22.17	122.4	29.2	1315.7	81	7.5	16.3
1030	DMA_13	391.2	9.6	175.7	41.23	6.28	50	6.57	166.3	39.0	5934.9	177	5.0	33.5
993	DMA_14	568.9	28.4	123.5	7.23	0.06	50	117.97	95.1	5.6	47.1	48	96.1	1.0
941	DMA_15	290.7	14.5	60.7	6.20	0.06	50	102.69	46.1	4.7	45.9	49	49.0	0.9
933	DMA_16	607.5	30.4	169.0	8.68	0.11	50	80.51	137.7	7.1	88.4	51	79.7	1.7
942	DMA_17	594.7	29.7	116.7	5.51	0.06	50	99.45	87.0	4.1	41.3	49	103.3	0.8
1001	DMA_18	425.7	21.3	6.4	0.62	0.00	50	210.98	-14.9	-1.4	-6.9	44	96.3	-0.2
855	DMA_19	713.7	35.7	36.7	1.72	0.01	50	162.79	1.0	0.0	0.3	46	157.6	0.0
949	DMA_2	267.5	13.4	80.2	7.04	0.09	50	76.09	66.8	5.9	77.0	52	44.9	1.5
837	DMA_20	253.1	12.7	35.1	2.99	0.04	50	73.10	22.5	1.9	26.1	52	45.0	0.5
940	DMA_21	298.7	14.9	142.3	11.15	1.95	50	5.72	127.4	30.0	1744.7	197	14.4	8.8
895	DMA_3	680.6	34.0	15.6	0.75	0.01	50	135.38	-18.4	-0.9	-6.5	47	131.9	-0.1
985	DMA_4	642.8	32.1	95.9	6.23	0.05	50	128.99	63.7	4.1	32.1	47	93.2	0.7
845	DMA_40													
844	DMA_5													
836	DMA_6	707.5	35.4	58.8	2.10	0.03	50	79.99	23.5	0.8	10.5	51	114.6	0.2
834	DMA_7													
839	DMA_8													
B - DMA zones that can not balance due to unreliable meter readings or wrong positioning of meters (+ve balance)														
1022	DMA_9													
C - DMA zones that can not balance due to no meter readings in at least 1 chamber														
841	DMA_5(BAREA)													





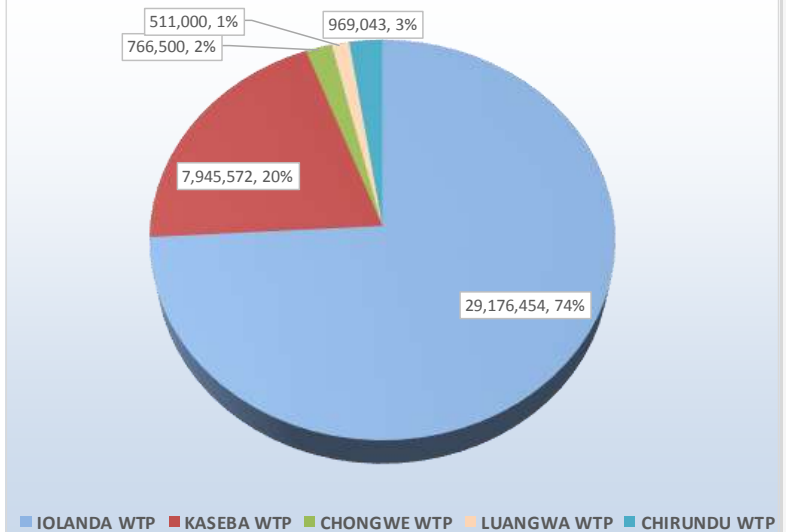
Stage III

Operations / Monitoring & Control

Addressing :

- Zone Management
- Bulk Meter Management
- Production Management & Analysis
- Performance Analysis & Energy Efficiency

WTP Production Volume (m3) per WTP - 2017



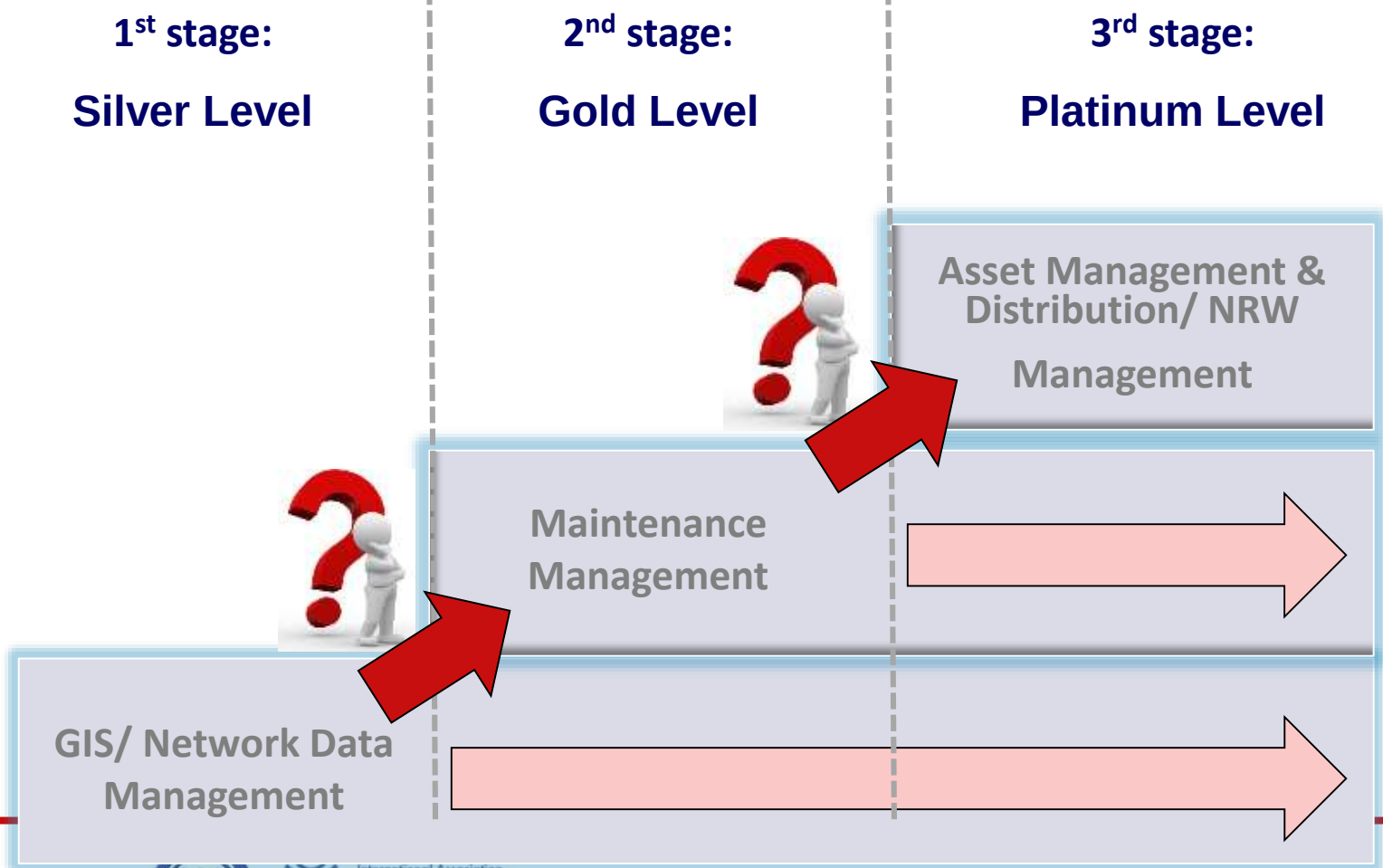
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Stages Progression



Asset Management Advisory Services to Water Utilities in SEE

Introduction of SEEAM Program

Stage 1 (Year 1):

To assist Utilities in setting up and maintaining a validated network geographical database, effectively performing proper Network Data Management as well as understand components of Integrated Asset Management (IAM).



Network Data Management

Stage 2 (Year 2):

To enable (a) Maintenance Management for improving productivity and efficiency of the maintenance function and service delivery as well as for registering maintenance problems for further use in Rehabilitation/ Maintenance Planning (Stage 3)



Maintenance Management

Stage 3:

Last stage will enable the main activities of Integrated Asset Management namely: (a) Distribution/ NRW Management, (b) Operations And introduce (a) Commercial Data Management, (b) Water Quality Management, Planning , (c) Rehabilitation/ Maintenance (d) Infrastructure Planning



Distribution Management
NRW



Distribution Management
Operations



Water Quality Management



Commercial Rehabilitation Planning



Infrastructure Planning



Asset Management Planning



Asset Management Advisory Services to Water Utilities in SEE

Introduction of SEEAM Program

Agenda



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STA-IAM Program Description



Stage I - Examples

Stage I > Cloud Operations

Example in Montenegro - Kotor



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The screenshot displays the EDAMS Network Assets Management software interface. The main window shows a map of the Kotor area with a network of water pipes and nodes. A detailed view of 'Water Pipe 314' is shown in the foreground, displaying various attributes and settings.

EDAMS Network Assets Management: KOTOR on 11.0.1.17

Water Pipe 314 - Water Pipe 314

Condition Assessment | Financial Information | Hyperlinks | Editing History | Characteristics

Main | Graphical | Connections | Spatial Relate | General | Losses | Logs | Images | Location

User Ref.: Water Pipe 314

Type: 1.Potable Water

Importance: [Dropdown]

GIS Key: 314

Main Group: Mechanical

Chains: 314 Type of Joint: Flanged

Construction Date: 1/ 1/1994

First Day of Use: 1/ 1/1994 Last Day of Use: 10/30/2017

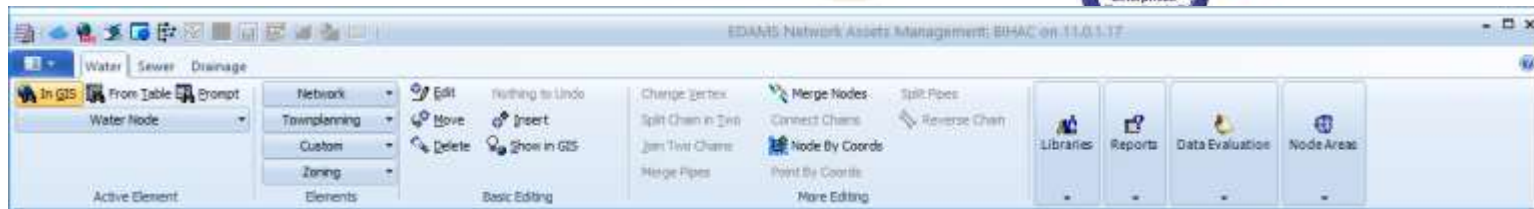
6561347.874462,4701793.845741 Width: 640 m, Height: 420 m, Scale: 1/2202

Stage I > Cloud Operations

Example in B&H - Bihac

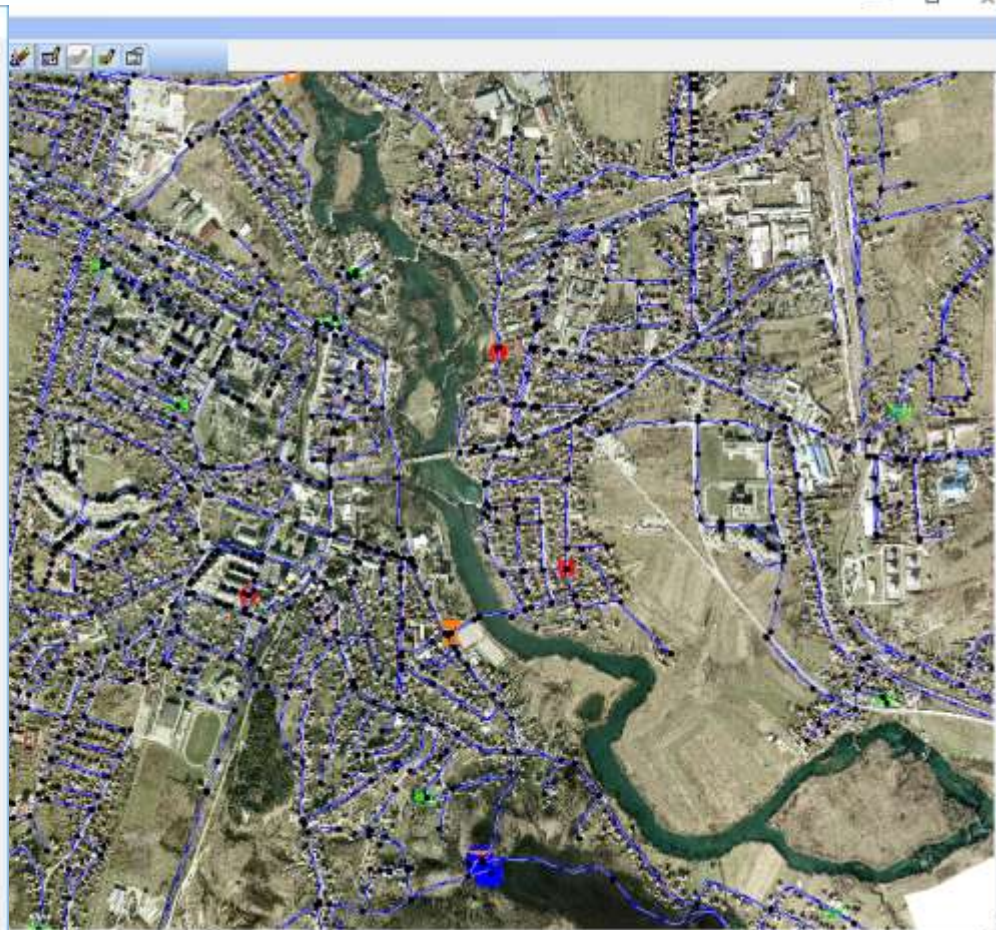


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EDAMS GIS - E:\01 Bosnia & Herzegovina\Bihac\Project Files\water_anela.egg

ID	Material	Class	Pipes Count	Pipes Length	Description	Nominal Diam.	Inside Diam.	Mass/Meter	Thickness	Replace ment	Original Cost	Currency	Cost
				(m)		(mm)	(mm)	(kg)	(mm)				
690	PEHD	DEFAULT	11	485.533		20	20	20	100.00	10.0			10/X
695	PEHD	DEFAULT	17	1123.418		25	25	25	100.00	10.0			10/X
721	PEHD	DEFAULT	5	952.953		32	32	32	100.00	10.0			10/X
693	PEHD	DEFAULT	3	111.186		33	33	33	100.00	10.0			10/X
696	PEHD	DEFAULT	18	1280.660		35	35	35	100.00	10.0			10/X
677	PEHD	DEFAULT	50	4222.353		40	40	40	100.00	10.0			10/X
661	PEHD	DEFAULT	119	17016.294		50	50	50	100.00	10.0			10/X
658	PEHD	DEFAULT	75	7076.930		63	63	63	100.00	10.0			10/X
736	PEHD	DEFAULT	5	2060.943		75	75	75	100.00	10.0			10/X
664	PEHD	DEFAULT	69	3402.226		80	80	80	100.00	10.0			10/X
659	PEHD	DEFAULT	150	22029.968		90	90	90	100.00	10.0			10/X
705	PEHD	DEFAULT	45	6932.454		100	100	100	100.00	10.0			10/X
678	PEHD	DEFAULT	137	46717.966		110	110	110	100.00	10.0			10/X
657	PEHD	DEFAULT	16	1449.094		125	125	125	100.00	10.0			10/X
660	PEHD	DEFAULT	19	1482.529		150	150	150	100.00	10.0			10/X
688	PEHD	DEFAULT	37	10174.512		160	160	160	100.00	10.0			10/X
686	PEHD	DEFAULT	23	2777.394		180	180	180	100.00	10.0			10/X
689	PEHD	DEFAULT	20	3416.980		200	200	200	100.00	10.0			10/X
663	PEHD	DEFAULT	19	3907.989		225	225	225	100.00	10.0			10/X
679	PEHD	DEFAULT	5	1240.740		250	250	250	100.00	10.0			10/X
657	PEHD	DEFAULT	3	1375.998		300	300	300	100.00	10.0			10/X
711	PVC	DEFAULT	3	728.921		40	40	40	100.00	10.0			10/X
709	PVC	DEFAULT	18	4836.438		50	50	50	100.00	10.0			10/X
725	PVC	DEFAULT	8	755.267		63	63	63	100.00	10.0			10/X
727	PVC	DEFAULT	1	341.470		75	75	75	100.00	10.0			10/X
696	PVC	DEFAULT	57	892.969		80	80	80	100.00	10.0			10/X
676	PVC	DEFAULT	536	92002.982		90	90	90	100.00	10.0			10/X
670	PVC	DEFAULT	21	1672.632		100	100	100	100.00	10.0			10/X
690	PVC	DEFAULT	85	27511.529		110	110	110	100.00	10.0			10/X
712	PVC	DEFAULT	1	605.363		140	140	140	100.00	10.0			10/X
685	PVC	DEFAULT	21	1416.825		150	150	150	100.00	10.0			10/X
696	PVC	DEFAULT	162	51537.095		160	160	160	100.00	10.0			10/X
668	PVC	DEFAULT	43	11493.721		200	200	200	100.00	10.0			10/X
662	PVC	DEFAULT	62	14458.915		225	225	225	100.00	10.0			10/X



Show Only Items In Use

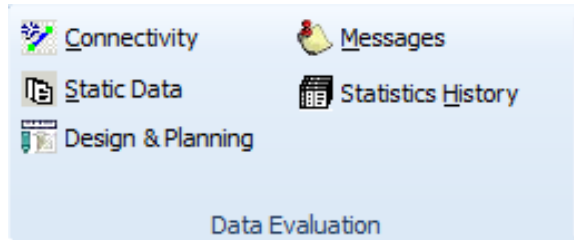
Close

3266/31.384787,4963500,449483

Width: 3.67 km, Height: 2.41 km, Scale: 1/12635

Stage I > Cloud Operations

Resolving Discrepancies



Messages

Msg. Type	Element Id.	Message Description
[Error]	3423	'Water Pipe 3423' has zero diameter which is not allowed! Use closed valve.
[Error]	3566	'Water Pipe 3566' has zero diameter which is not allowed! Use closed valve.
[Error]	3567	'Water Pipe 3567' has zero diameter which is not allowed! Use closed valve.
[Error]	3568	'Water Pipe 3568' has zero diameter which is not allowed! Use closed valve.
[Error]	3569	'Water Pipe 3569' has zero diameter which is not allowed! Use closed valve.

Messages

Msg. Type	Element Id.	Message Description
[Hint]	339	Possible link problem between Pipes AC 80 and PE 110 because their internal diameters differs
[Hint]	382	Possible link problem between Pipes AC 100 and AC 80 because their internal diameters differs
[Hint]	391	Possible link problem between Pipes AC 100 and AC 80 because their internal diameters differs
[Hint]	433	Possible link problem between Pipes AC 80 and PE 63 because their internal diameters differs
[Hint]	742	Possible link problem between Pipes PE 63 and AC 65 because their internal diameters differs
[Hint]	448	Possible link problem between Pipes PE 160 and PE 110 because their internal diameters differs
[Hint]	457	Possible link problem between Pipes PE 110 and PE 63 because their internal diameters differs
[Hint]	495	Possible link problem between Pipes AC 125 and AC 80 because their internal diameters differs
[Hint]	496	Possible link problem between Pipes AC 80 and PE 63 because their internal diameters differs
[Hint]	500	Possible link problem between Pipes AC 100 and PE 50 because their internal diameters differs
[Hint]	776	Possible link problem between Pipes AC 80 and PE 63 because their internal diameters differs
[Hint]	509	Possible link problem between Pipes AC 100 and PE 63 because their internal diameters differs
[Hint]	514	Possible link problem between Pipes AC 80 and PE 63 because their internal diameters differs
[Hint]	847	Possible link problem between Pipes PE 50 and AC 80 because their internal diameters differs
[Hint]	521	Possible link problem between Pipes AC 100 and AC 200 because their internal diameters differs
[Hint]	565	Possible link problem between Pipes PE 63 and AC 50 because their internal diameters differs
[Hint]	583	Possible link problem between Pipes AC 80 and AC 100 because their internal diameters differs
[Hint]	589	Possible link problem between Pipes AC 150 and AC 80 because their internal diameters differs
[Hint]	618	Possible link problem between Pipes AC 80 and AC 150 because their internal diameters differs
[Hint]	729	Possible link problem between Pipes AC 150 and PE 50 because their internal diameters differs
[Hint]	765	Possible link problem between Pipes AC 80 and PE 63 because their internal diameters differs
[Hint]	678	Possible link problem between Pipes AC 80 and POC 32 because their internal diameters differs
[Hint]	823	Possible link problem between Pipes AC 63 and AC 80 because their internal diameters differs

Errors : 0, Warnings : 28, Hints : 297

Discrepancies History Messages

Select Date: 10/23/2017 3:46 PM

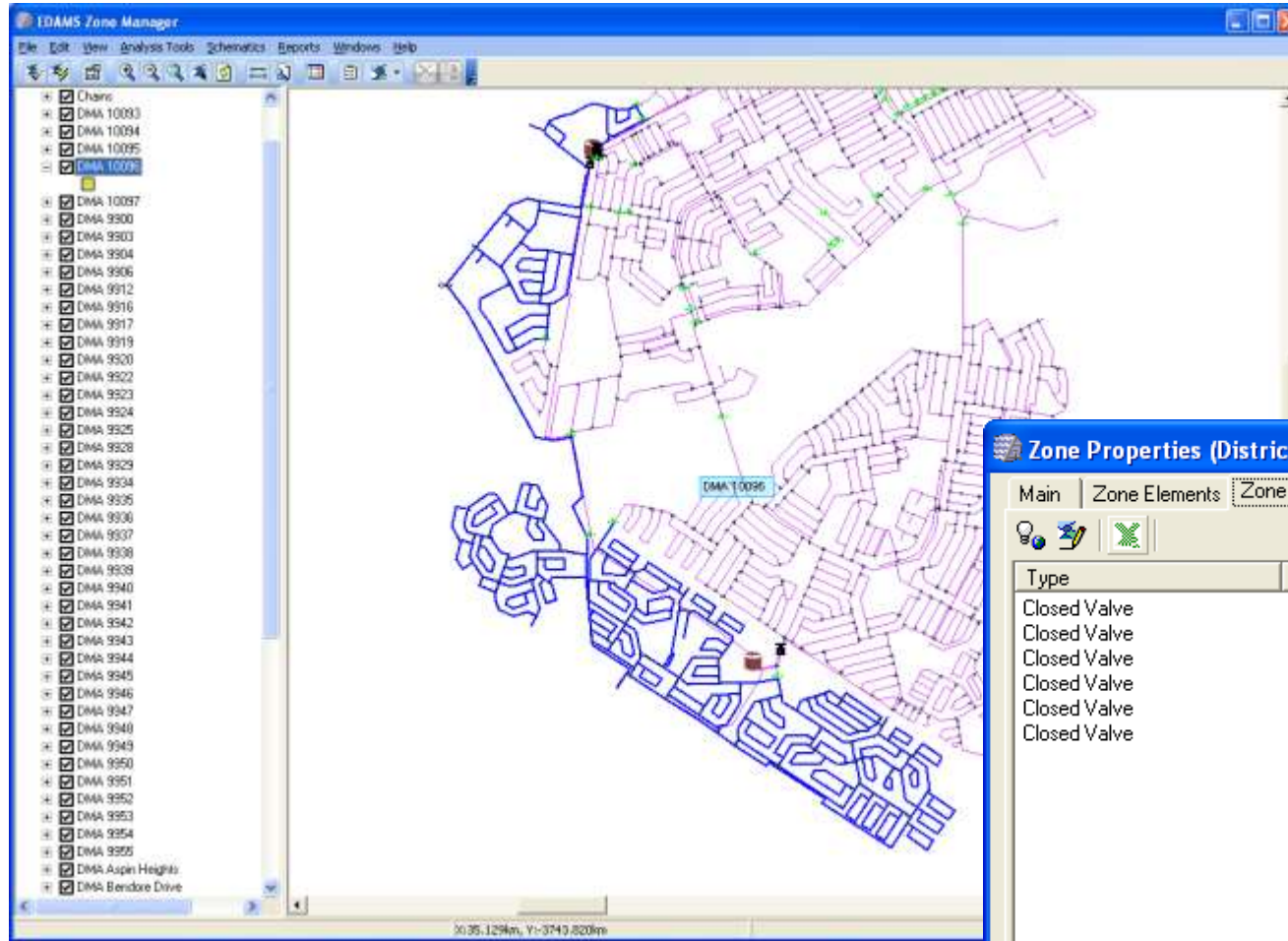
Date	10/23/2017 3:46 PM
Pipes Length	566150.5991
Reservoirs No	2
Pump Stations No	0
Boreholes Sites No	108
Valves No	2396
Hydrants No	1985
Control Valve Chambers No	0
Supply Points No	0
Air Valves No	14
Relief Devices No	0
Meter Chambers No	0
Geo Water Connections No	0
Connectivity Errors	104
Connectivity Warnings	165
Connectivity Hints	0
Static Errors	405
Static Warnings	3542
Static Hints	0

SEE AM: IAM Best Practices

Stage I – Towards Zone Management



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Zone Properties (District)

Main | Zone Elements | **Zone Boundaries** | Statistics | Shared Zones | Supply

Type	ID	Ref	Direction
Closed Valve	1615	Valve 941	
Closed Valve	1616	Valve 942	
Closed Valve	2134	Valve 1461	
Closed Valve	4972	Valve 4324	
Closed Valve	4978	Valve 4330	
Closed Valve	5004	Valve 5004	

OK Cancel

Stage I > Cloud Operations Monitoring & Reporting



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Asset Management Advisory Services to Water Utilities in South-Eastern Europe (SEEAM)

Weekly Discrepancies Report

Utility: LOZNICA

Water Elements Summary

Date	Length of pipes (km)	Reservoir sites	Pump stations	Borehole sites	Valves	Hydrants	Control valve chambers	Supply points	Air valves	Relief devices	Meter chambers	Geowater connections
23/10/2017	755.29	0	1	0	119	1	1	0	5	0	1	1
16/10/2017	755.47	0	1	0	96	1	1	0	2	0	1	0
09/10/2017	754.49	0	1	0	46	1	1	0	1	0	1	0
02/10/2017	754.21	0	1	0	42	1	1	0	1	0	1	0
25/09/2017	752.25	0	1	0	31	1	1	0	0	0	1	0

Water Network Summary

Date	Water connectivity errors	Water connectivity warnings	Water connectivity hints	Water static errors	Water static warnings	Water static hints	Water design/ planning errors	Water design/ planning warnings	Water design/ planning hints
23/10/2017	7,928	170	0	3,927	20,349	0	0	418	328
16/10/2017	7,919	160	0	3,930	20,621	0	0	421	328
09/10/2017	7,745	139	0	3,951	21,038	0	0	425	327
02/10/2017	7,924	131	0	3,968	21,485	0	0	421	324
25/09/2017	7,956	116	0	3,969	21,677	0	0	415	319



Stage I > Cloud Operations Monitoring & Reporting



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Asset Management Advisory Services to Water Utilities in South-Eastern Europe (SEEAM)

Weekly Audit Trail Report

Audit Trail - Detailed

Start date: 16/10/2017

User Name	Employee Name	Login Date	Logout Date	Session Duration (hours)
JURICA	Jurica Petrovic	16/10/2017 8:24:56	16/10/2017 8:29:39	00:05:00
JURICA	Jurica Petrovic	16/10/2017 8:31:57	16/10/2017 9:48:23	01:17:00
JURICA	Jurica Petrovic	16/10/2017 9:48:38	16/10/2017 14:08:47	04:20:00
JURICA	Jurica Petrovic	16/10/2017 14:08:55	16/10/2017 14:09:18	00:01:00
JURICA	Jurica Petrovic	17/10/2017 7:07:01	17/10/2017 12:28:12	05:21:00
UTVSI	UTVSI (HUB)	17/10/2017 9:10:59		
JURICA	Jurica Petrovic	17/10/2017 12:49:18	17/10/2017 12:52:33	00:03:00
UTVSI	UTVSI (HUB)	17/10/2017 13:08:42	17/10/2017 13:39:03	00:31:00
NEMANJA	Nemanja Vlasisavljevic	17/10/2017 13:32:09	17/10/2017 13:32:51	00:00:00
JURICA	Jurica Petrovic	17/10/2017 13:38:41	17/10/2017 14:12:15	00:34:00
JURICA	Jurica Petrovic	18/10/2017 7:06:16	18/10/2017 14:34:44	07:28:00
JURICA	Jurica Petrovic	19/10/2017 7:07:41	19/10/2017 12:16:25	05:09:00
UTVSI	UTVSI (HUB)	19/10/2017 9:14:17		
JURICA	Jurica Petrovic	19/10/2017 12:42:31		
JURICA	Jurica Petrovic	19/10/2017 13:57:15	19/10/2017 13:58:30	00:01:00
JURICA	Jurica Petrovic	20/10/2017 8:16:36	20/10/2017 10:38:47	02:22:00
UTVSI	UTVSI (HUB)	20/10/2017 10:05:50		
JURICA	Jurica Petrovic	20/10/2017 10:38:58	20/10/2017 13:58:58	03:20:00
UTVSI	UTVSI (HUB)	20/10/2017 13:50:52	20/10/2017 13:54:00	00:04:00
UTVSI	UTVSI (HUB)	20/10/2017 13:54:12		
USER1	User1 User1	23/10/2017 8:43:06	23/10/2017 8:51:21	00:08:00
USER1	User1 User1	23/10/2017 13:24:49	23/10/2017 13:37:41	00:13:00



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Asset Management Advisory Services to Water Utilities in SEE

Introduction of SEEAM Program



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Agenda

-  Understanding Integrated Asset Management (IAM)
-  STA-IAM Program Description
-  Live Demonstration / Examples
-  Summary & Program Benefits

Asset Management Advisory Services to Water Utilities in SEE

Introduction of SEEAM Program



Stage I - Silver:

To assist Utilities in setting up and maintaining a validated network geographical database, effectively performing proper Network Data Management as well as understand components of Integrated Asset Management (AM).

Network Data Management

Stage II - Gold:

To enable (a) Maintenance Management for improving productivity and efficiency of the maintenance function and service delivery as well as for registering maintenance problems for further use in Rehabilitation/ Maintenance Planning (Stage III)

Maintenance Management



Stage III - Platinum:

The last year's stage will enable operational activities of Integrated Asset Management namely: (a) Operations – Monitoring /Control and (e) Distribution Management

Monitoring & Control /Operations

Distribution Management

Water Quality Management

Infrastructure Planning

Commercial Rehabilitation Planning

Asset Management Planning

Asset Management Advisory Services to Water Utilities in SEE

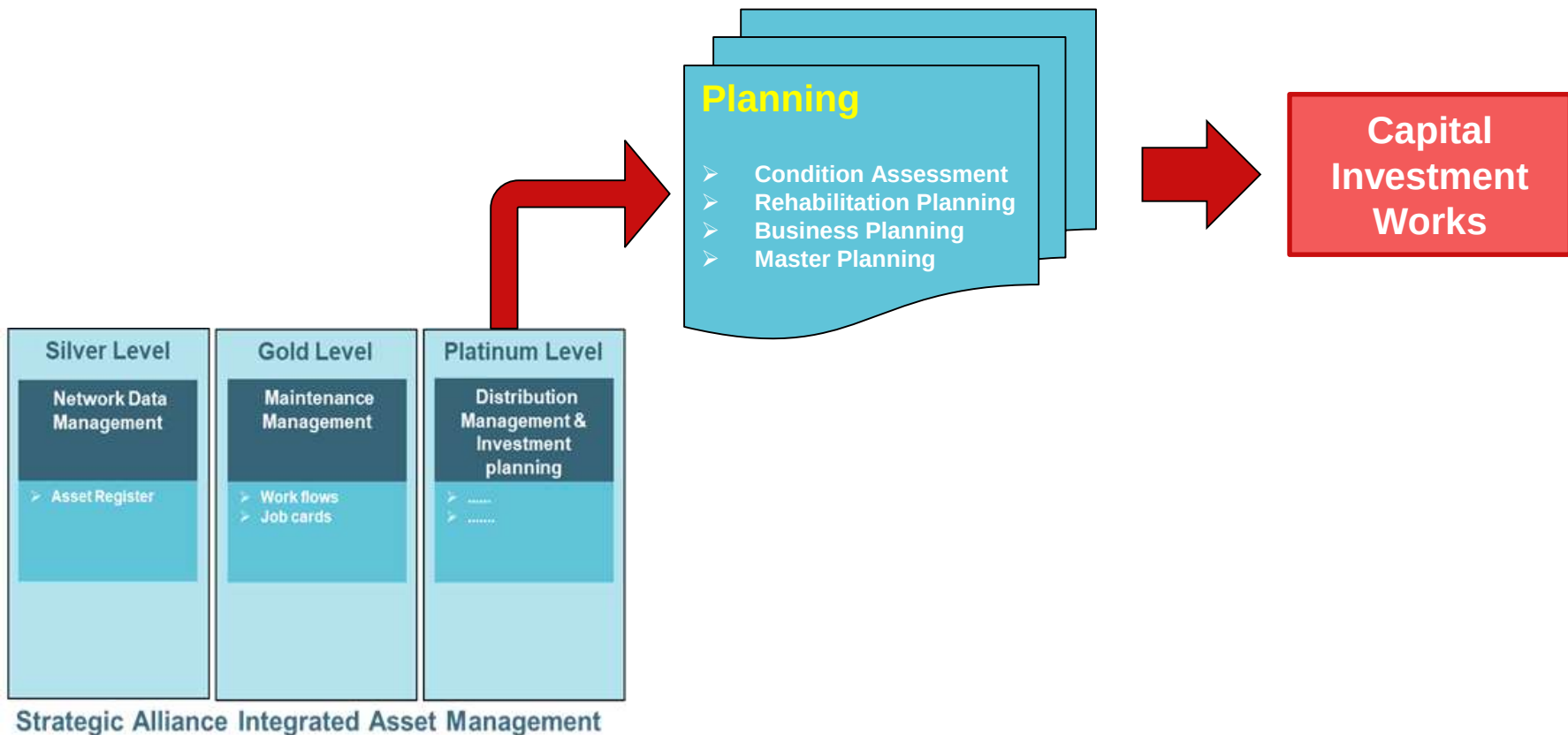
Introduction of SEEAM Program

Program Benefits

Roadmap to Long term Sustainability & Capital Investments



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Strategic Alliance Integrated Asset Management



Program Benefits

The implementation of IAM at Utilities is expected to result in substantial benefits to the Utilities in terms of Financial Benefits, improved Service Delivery and improved Conformity to regulation & transparency.



Financial benefits will be realised through Increased Revenues, Reduction of Operating costs, less annual rehabilitation and maintenance costs and a considerable reduction in future Capital costs.



Improved service delivery will be achieved through better Customer services, better water delivery (in terms of both Pressures and Quality), quicker response to maintenance problems and more effective Emergency & Crisis Management.



Conformity to regulation & transparency will be achieved through the production of a more accurate Balance sheet, Water Quality reporting, Water Audit reporting and more accurate budgets on Operational Costs and Capital Cost requirements.



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