Nice, 10 SEPT 2021

Ravda conference 10-14 SEPT 2021 Prof Dr Emile Karailiev - Sorbonne -

Vanguard financing solutions Environment/ Integrated Disaster Risk Management plan for the Varna Region TA2019007 BG HUB

Communicating MARITIME SPACIAL PLANNING- MSP: an inspiring era of cooperation between institutions In addition to the work led by the European Commission, EASME and the European MSP Platform ,MSP is currently benefitting from very high levels of cooperation, communication opportunities and tools enabling knowledge exchange between stakeholders and institutions from a number of key initiatives, namely the MSPglobal Initiative and International MSPforum. Through their International Forum for MSP (MSPforum), the European Commission's Directorate-General for Maritime Affairs and Fisheries (DG MARE) and the **Intergovernmental Oceanographic Commission (IOC) of UNESCO** facilitate the understanding and sharing of MSP practices worldwide. More specifically, the MSPforum provides a space for participants to build onthe knowledge acquired through thematic panels and technical workshops, to promote open and shared collaboration on MSP in their own countries and, in turn, to form an engaged and active stakeholder community. **Lessons of MSPforum events**: Four of the six meetings of the MSPforum have taken place since 2019These have brought together approximatly 600 participants from all continents to discuss and exchange good practices and in doing so, are mpowering a new generation of planners, sectors, businesses and civil organisations to conserveour ocean and seas and use them in a sustainable way. **The use of videos**: featuring the event location, participantsand different moments in a short summary video can help strengthen communication of the activities and energise the MSP community.As in this case, the videos (recorded or post produced) should be highly visible in the news/media section of the organiser's website and accessible in dedicated video, Libraries on platforms such as youtube or video where they can easily be found and shared afterwards.These meetings are also complemented by speakers as well as outputs including reports and visual summaries of the exchanges. Visual reports are particularly valuable resources which can then be used to develop other effective communication actions targeting a wider audience. **The Intergovernmental Oceanographic CommissionIOC-UNESCO's Maritime Spatial Planning.** A Step-by-Step Approach toward Ecosystem-based Management is an internationally-recognised standard.It presents various examples of **alternative financing mechanisms and stakeholder engagement** that MSP teams can use to develop their own strategies, developed in close cooperation between experts and communicators of the MSP and MSPGlobal Forums platforms, seek to further complement this initial body of work

Through concrete examples, it describes how open and engaging communication and obtain financing on MSP, and can help achieve the goals of vanguard, informing different levels of audiences and improve adoption of MSP principles across sectors to eventually implement MSP strategies on the ground. Demonstrating MSP in the making : Although maritime spatial plans are still being discussed and developed across Europe, in the context of the EU's MSP Directive, MSP in the making is already an inspiring process for a more collaborative approach in addressing policy making.

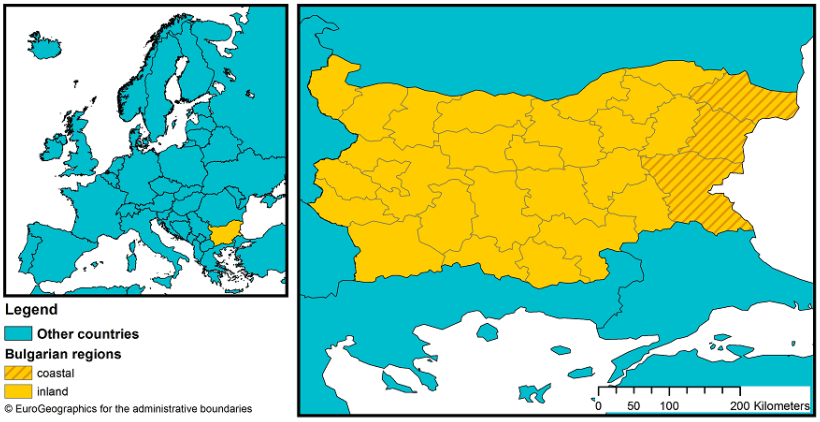
MSP as a "concept" can be communicated through several, practical and concrete examples.

Communicating steps towards MSP as a solution for local communities: in many coastal communities dependant on a limited range of activities, economic wellfare has plummeted because of major societal and global changes, shifts in consumption patterns or consumer expectations… such is the case in several small fishing harbours whose communities have faced severe challenges with the downfall of their fleet.

With the development of the **Blue Economy**, changes are brought by new economic opportunities in maritime tourism, offshore energy and innovative marine bioresources.

These opportunities are at the core of MSP and should be communicated from the start to the local and most concerned communities via municipalities, local development agencies, but also through other levels of local governance and community such as schools or tourism offices. Indeed, MSP actions can be at the centre of community-building and local-branding initiatives such as in the case of Black Sea :

Three of Bulgaria's 28 districts, regions (*Oblasti)* are coastal.DOBRICH (100 000 inhabitants) VARNA (400 000) and BURGAS (200 000) nut 3 (TOTAL 200 000 – 800 000)



The Black Sea is a key EU Eastern

DOBRICH, VARNA, BOURGAS

		nief piece of legislation governing population in the event of natural disasters
Civil protection	**Disaster Protection Law**	• Entitles the Fire Safety and Civil Protection Directorate General (FSCP DG) to control, mandate and penalise lack of compliance
	National Disaster Protection Program	• Regulates plans and budgets for preventative procedures every year • Regulates which organisations should have plans for protection in the event of disasters, the content of plans, and how they are updated
Coastal management	**Marine Strategy of Republic of Bulgaria**	• Includes activities in the event of sea-related hazards, as drawn up by the 'Maritime Administration' • Designates two units for disaster recovery – the first is the Marine Rescue and Coordination Team (MRCT) and the other is the Shore Disaster Rescue Team (SDRT) • Fulfills requirements of Marine Strategy Framework Directive (2008/56/EC)
	Law on Territorial Planning	• Serves as the main source of ordinances and other normative documents governing land use planning in different spheres • Involves both master and detailed development plans, the latter of which require an assessment of general stability • States that property owners are obliged to let competent authorities perform any necessary stabilization activities • Regulates the construction of buildings and facilities in landslide areas
Water and flood management	**Water Act**	

In response to these challenges, Bulgarian authorities in local, regional and national level are prepared several ***strategic documents but an integrated overview is lacking***

and it is not clear whether any "gaps" remain..

Current Situation in the Sector

The current situation as of hazards from floods, oil spills, forest fires, earthquakes, extreme temperatures, oil spills, radiation and nuclear disasters, is presented in the document of Varna administration

"Strategy to Reduce the Risk of Disasters on the horizon of 2022"

The experience of the floods that have occurred over the last years on the territory of the Municipality of Varna reveals that the activities implemented so far to reduce the risk of floods are insufficient and are often applied after the events. This should address all aspects of risk management, focusing on prevention, protection, preparedness, including flood forecasts, early warning systems, and taking into account the Varna terrain
The floods on the territory of Varna municipality are usually very strong-high. Especially dangerous are the floods for the city and the areas where watertight, streets and pavements create conditions for high velocity water flows, rapid concentration, and almost no loss of infiltration in the soil. A similar effect also occurs in the valleys, with a large slope at the bottom and the slopes where the rapid concentration of drainage waters from the catchment areas is capable of producing catastrophic water flows with very little durability but a high destructive force. Reducing the risk of floods is done primarily by building up hydro-technical facilities, good spatial planning in the area and, last but not least, by increasing preparedness to prevent or reduce the negative consequences of floods through preventive measures, population training, adequate preparation, planning rescue activities, etc. It is also necessary to regularly clean the drainage channels and the channels and to maintain them in conditions of ensuring the conductivity of the waters

Forest fires - Climate change over the last decades has led to an increase in the incidence of forest fires and the size of the affected areas. In terms of global warming and drought, it is logical to expect an increase the fire hazard in forest ecosystems. In this regard, fire and forest management fires should be designed and implemented similarly to the activities in the Mediterranean (Greece, France, Spain, Portugal, etc.) where the entire or predominant part of the territory is defined as sev erely threatened by fires. It will be needed to reinforce the design and the management of video surveillenace, access control and fire alarm systems.

Earthquakes -From seismological point of view, Bulgaria is located in the Alto-Himalayan seismic belt. The territory of the Republic of Bulgaria is characterized by high seismic activity and is classified as a "second rank seismic-dangerous stretches" on the Earth. Three internal seismic areas are identified on the territory of the country, with the municipality of Varna falling into the Shabla zone (maximum magnitude to 8th, intensity on 9th grade on the Black Sea coast). The reduction of seismic risk is mainly due to improvement of the structural planning and engineering-engineering design, construction and operation of the constructions

Danger of meteorological phenomena such as: droughts, strong winds and winds, heavy snowfalls, snow storms, icing and extreme temperatures.

Drought is a consequence of reducing rainfall over a long period of time from time. Often a number of weather elements such as high temperatures, strong winds and low relative humidity occur in conjunction with drought, which makes this phenomenon very pronounced. A row indicators for land in the atmosphere and the ground should be monitored operationally to determine the extent of drought and its influence. The negative trend observed in the multiannual amendments to the rainfall for many regions of Bulgaria shows that there is a high probability of occurrence of frequent and intense droughts in the country. That's what it takes investigate and analyze the risk of drought and develop and implement measures for its reduction and possible removal. As the basis for developing such measures and must serve research on climate change, the rainfall and air temperature, plant cover condition, anomalies in soil humidification, as well as European practices and normative acts in this area.

Strong winds are not a common phenomenon for Bulgaria. The average annual of the number of days with a strong wind for the non-mountainous part of the country is between 5 and 20days. The hurricane wind, exceeding significantly wind load at the sizing of buildings and objects is a rare phenomenon, but nevertheless it happens. Strong winds on the territory of the country can lead to interruption of power supply, blocking of roads, disturbances of infrastructure and are a threat to people's lives and property.
Snow blizzards and ice are often a phenomenon for Bulgaria, especially in its northeastern part. They are characteristic of the months December and January Snow storms and icy conditions cause airborne disruption communications, blocking roads and possibly putting them at risk situation the lives of many people. Snowfall can be disastrous mainly in settlements and cause not only blocking of transport, but also interruption of power supply, water supply, medical supply and supply of food products to the population. Low temperatures are the reason for the icing of the power lines and other open communication lines.
The extreme disasters can also be attributed to natural disasters temperatures. . In addition to impeding the day-to-day activities of the person, in all respects, extreme heat causes various accidents and crisis situations. In case of excessive heating, the railways are deformed rails and soften the asphalt road pavement, which can lead to derailment of trains and serious road problems. Snooping on conductors of the power lines cause serious disturbances and damage of the power transmission network. In a critical situation, a number can also fall proceedings. Extreme heat can also make human sacrifices.

Radiation and nuclear disasters - Despite stringent safety measures for different types of work nuclear reactors and the availability of automated control and control systems and protection, the practice of exploiting them shows that it is possible the occurrence of situations that are accompanied by an emergency release of radioactive substances in the environment. Radioactive contamination could occur as in an emergency situation at the Kozloduy NPP, accompanied by both cross-border radioactive contamination, accompanied by an emergency release of radioactive substances in the environment.as a result of a nuclear or radiological emergency in other countries, as well as in accidents with vehicles (cars, railway wagons, sailing vehicles and aircraft) carrying radioactive materials.

Assumptions and risks

Assumptions

In addition to what has been mentioned in the *overall assumptions that the EIB and the Service Provider from the continued and active collaboration of the authorities of the Varna region and relevant stakeholders; will be given timely and*

complete access to all relevant documents, other information and people related to activities; will be given access to attend all relevant meetings in the context of the assignment.

The Service Provider shall ensure all proper mitigation measures to ensure successful delivery of services if any of the above assumptions is not materialise), we would like to mention the following assumptions that could affect the execution of the contract:

- No important changes of the decisions makers (top human resources in the Regional Administration of Varna and major stakeholders institutions) and the direction of the strategy of the authorities;
- No force majeure, socio-economic and political conflicts;
- No substantial change of climate conditions, natural catastrophes, etc.

Risks

The main risks that could affect the successful implementation of the Assignment.

We have presented these risks, along with appropriate mitigation measures, in the table below.

Besides the 4 risks, we have also identified 4 further risks, which we have included in the table.

Risk	Risk Level	Mitigation measures
Difficulties related to the lack of cooperation with the relevant counterparts	Low / Moderate	Meeting with main counterparts, well understand their purposes and propose the common actions of interest for each of them
Incomplete gathering of relevant information	Moderate	Establish working mechanisms of gathering (collection) as much as complete relevant information
Inconclusive/vague findings and recommendations	Low	Review and revise the findings and recommendations to be more precise
Findings and recommendations that are not realistic to be implemented	Moderate	Try to draft findings and recommendations as more as possible realistic to be implement into the practice
Lack of precise flood hazard and other disasters description and risk maps,	Low / Moderate	Prepare in depth relevant analyses and descriptions drafting precise risk maps and proceed to their monitoring and evaluation
Unclear division of competencies among central and regional authorities. There is limited communication between different stakeholders.	Moderate	Analyze the documents describing the roles of different authorities and organize common meetings with central and regional authorities in order to understand the reasons of their unclear division of competences. . Many stakeholders believe the government in Sofia has little sensitivity to local needs and thus does not prioritize action to secure funding for infrastructure and industries in coastal zones
Plans lack up-to-date prevention, preparedness and recovery measures.	Low/Moderate	Updating the plans as of different measures of prevention, preparedness and recovery in order to better drafting the integrated disaster risk management plan
No regional early warning system based on storm impact, and other disaster risks, etc.,	Moderate/High	To solve this lack which is of great importance for the management of risks and security of people, equipment and infrastructure

Strategy Proposed approach

Data collection _At arrival in Sofia, the Team of Key experts meet Varna of the Team of Key Experts and during the organization of **kick-off meeting** with beneficiary, the Experts will request the copies of local laws and regulations, as well the project of the Program of municipality of Varna and emergency plans to reduce risks of disasters.Permanent close is established with the Beneficiary of the assignment - **the Varna Regional administration. "The Beneficiary is instructed and aims ensure that his employees co-operate with the EIB and the Service Provider in relation to the provision of the TA." the Beneficiary is instructed to provide the Service**

Provider with such information and documents at their disposal which may be relevant and necessary to the provision of the TA.The Service Provider may request the assistance of the Beneficiary in obtaining copies of local laws, regulations and information which may affect the Team of experts in the performance of their assignment. Planning of Meetings is organized with main stakeholders identified during the Kick-off Meeting and with the support of the Varna Regional administration.All Diagnosis, studies and notes and reports performed by the team of experts are based on desk review (taking into account the local laws, by-laws and regulations) and the minutes, findings and conclusions of exploratory interviews/workshops with the regional authorities and local and regional stakeholders

1.1.1 Market Assessment Study

This methodology included Depth analysis of the current situation (see our quick overview in the beginning of this paper) – detailed assessment and monitoring and evaluation – natural and human factors – governance of coastal zones and disaster risk Presentation of policies for coasts and disaster risk in Bulgaria, flood risk management and mitigated measures undertaken of **RISK REDUCTION AND WATER CLEANING - FIGHT AGAINST POLLUTION**
In depth analysis of the Black sea region directorate management plan for the period 2016-2021 and relevant directives, regulations and laws (disaster protection law, national disaster protection program, marine strategy of Bulgardevelopment strategies of the coastal Bulgarian districts (Varna, Burgas, Dobrich), flood risk management plan for the Black Sea region, national strategic plan for aquaculture and National regional development strategy of Bulgaria (2018-2022).
Policies strengths – early warning system at two levels;
and policy challenges (exclusive state ownership of beaches, unclear division of competencies among central and regional authorities, plans lack up-to-date prevention, preparedness and recovery measures and insufficient communication and dissemination, notably low public participation and engagement of non-state actors in coastal management)
Analysis of documents such as community **civil protection safety plan** and prevention plan for coastal risk and emergency plan
Trends, projects, findings, recommendations, conclusions and perspectives of fight against disasters on Varna region/ Black sea

and outputsOrganisational and reporting structure and inputs envisage between the Team Leader (80 W/D), who will coordinate the overall assignment and lead the workshops with the beneficiary, Key Experts (Expert 2 (60 W/D) who will focus on aspects of the assignment related to the identification and potential reduction of natural and man-made disaster risk; and Expert 3 (40 W/D), who will focus on aspects of the assignment related to the management of emergency situations and capacity building and a legal

Non Key expert The team of KE consider that in the beginning of the assignment will need a NKE, Legal Expert Bulgarian, perfectly fluent in oral and written English.

1.1.2 Task/Activity 1 Diagnosis: Description of the current emergency response system in the Varna Region

Task 1.1. Emergency response system of the regional authority: During the first step of this diagnosis-stage, the 3 KE experts will analyse the current response management approach of the regional authority by carrying out at least **following sub-tasks**:

1.1.1 Meet with the EIB in Sofia on the very first day in Bulgaria (before the kick-off meeting) to present the team and the project
1.1.2 Kick off meeting, to be held in Varna with the stakeholders
1.1.3 Identify potential disaster risks in the region, collect and examine available strategic documents,
1.1.4 Collect and examine available strategic documents
1.1.5 Assess organizational structures, describe training and knowledge sharing practices,
1.1.6 Analyze systems used and technology applied,
1.1.7 Make an inventory of equipment (as a minimum: type, age, compatibility, maintenance and replacement cost, procurement procedures applied

The Diagnosis will be based on desk review and involve exploratory interviews/workshops with the regional authorities and local and regional stakeholders on which will participate the three KE and NKE Legal expert.
The Team will propose systems for collecting, storing, verifying and processing data, with an overall assessment of its level of complementary, synergy and coherence of the work coordinated by the Team Leader.
The contacts and meetings/interviews will be organized with the support of the Beneficiary – The Regional administration of Varna

Task 1.2. Links of the emergency response system from the region with systems at other levelsDuring the second step, in order to link the analysis made in tasks 1.1. with the overall emergency response on the territory of the region, the team will assess how the emergency response system of the Varna region is linked (and integrated) with other levels such as corporate/municipal and national/EU

- Main aspects for assessment in this task are the complementary of different strategies/systems, their coordination, available equipment and overlap or gaps.
- The analyses shall identify capacity building needs, sharing of resources opportunities, subsidiary and economies of scale

Deliverable Task 1 Baseline report on the risks and status of the emergency system in the Varna region (within 3 months of the start of the assignment)The Team work in the field and in desk documentary research will be coordinated by the Team Leader (see above)The contacts and meetings/interviews is organized with the support of the Beneficiary – The Regional administration of Varna and identified. stakeholders

1.1.3 Task/Activity 2 Benchmarking with best practice examples of similar scale regions in the EU and identifying gaps in terms of organization and equipment.-

Task 2.1. Case studies The two similar regions within the EU (but not in Bulgaria) in which the case studies will take place are located in Romania. Bulgaria and Romania provide the EU access to the Black Sea and are therefore the main drivers of the initiatives related to Maritime Spatial Plans, MSP in the Black Sea region. That is why during our work on integrated disaster risk management plan for the Varna region the team of experts envisages to perform the study in Romania (Mangalia/ Constanta and Mamaia) and a case study style description of their approach with particular emphasis on key aspects relevant for the Varna region.

Task 2.2. Main gaps and potential for improvement-

- Summarise the main gaps based on the findings
- Identify potential improvements
- Identify and propose elements which will lead to the development of a capacity-building programme and an investment programme.

Deliverables Task 2:

- Overview of main gaps and potential improvements for the regional authority
- Two regional case study descriptions (around 5 pages each)
- Proposal of a capacity building program for the Varna region
- Proposal of an investment program for the Varna region
- Summary report about of the workshop with regional authorities and other stakeholders to present main gaps, potential improvements, case studies and elements proposed for capacity building and investments.

The findings under this task shall be presented by the team of key experts in a workshop with the regional authorities and local and regional stakeholders. This workshop shall take place in Varna at the premises of the regional authority.

1.1.4 Task/Activity3 Developing the Regional Disaster Risk Management Plan-

Performed by KE1 and KE2. Total = 60 W/D

Developing the Regional Disaster Risk Management Plan on the basis of the currently existing plan described under task 1 and feedback provided during the workshop of task 2.

- It shall comply with applicable legislation and apply international best practice.
- It shall also include a timeline and detail for roll-out of capacity building components and an investment program in order to create the enabling environment for the regional disaster risk management plan.
- The findings under this task shall be presented by the team of key experts in a workshop with the regional authorities and local and regional stakeholders. **This workshop shall take place in Varna at the premises of the regional authority.**

Deliverables Task 3 :

- **The Regional Disaster Risk Management Plan is produced and approved**
- **A roadmap for implementation has been identified**
- **Summary report about the workshop with regional authorities and other stakeholders to present the plan has been produced**

2 Backstopping and involvement of members of the consortium

2.1 Presentation and roles of consortium members

The role of Assignment Managing Party has been assigned to **SUEZ Consulting (SAFEGE)**, leader of the consortium for the Framework agreement to support EIBAS activities inside and outside EU-28 - Lot 1: Environment. Established in 1919, SUEZ Consulting (SAFEGE) is a world leader in the design and management of projects in the water, environment, transport and infrastructure sectors. We provide technical assistance, management assistance and capacity building at the institutional and human resources levels in **more than 100 countries worldwide**.

SUEZ Consulting (SAFEGE) possess the necessary multidisciplinary capability to support the sustainable cities and regions development; planning-stage integration of the different technical disciplines involved and incorporation of environmental and social considerations alongside economic and technical ones.

For over 60 years, we have been providing advice to public and private institutions in the infrastructure sector and areas which are fundamental to our daily lives and sustainable development of our cities. In fact, our **core business** is related to services performed in **sustainable urban development and related infrastructure design and management**.

The table below summaries the relevant main sectors, sub-sectors and areas of expertise relevant for the urban and regional development in which SUEZ Consulting and its staff have a successful experience track record experience.

Sustainable Cities	**Transport:** Urban mass transit and mobility, urban roads, urban freight and logistics.
	Energy and Power: Energy efficiency, end-use efficiency, utilities, climate change adaptation
	Water, Waste, Sanitation: Water, waste, sanitation and sewerage, utilities.
	Other 'Urban' and horizontal aspects: Resettlement, affordable housing and slum redevelopment, cultural heritage, environmental impact, climate change mitigation, social inclusion, communication, project financing, etc.

- ***Responsibility***

SUEZ Consulting (SAFEGE) will be responsible for the overall coordination and management of this Assignment, supervising the production of all deliverables, ensuring its proper execution in accordance with the terms of reference, international best practices and local needs and circumstances, as well as providing most of the Assignment Team members and the backstopping facilities described in section 3.3. We will also be responsible for supervising the inputs of the subcontractors described in the following section. No other consortium members will be involved in this Assignment.

2.2 Subcontracting arrangements

No subcontracting is foreseen for this assignment

2.3 Support facilities

Although backstopping is an essential element of project implementation, it should be discrete. The work of the consortium back office in Brussels should be largely invisible to the Contracting Authority (EIB, through the Service Provider Procurement and Contract Management Division) and should not intrude on the day-to-day implementation of the Assignment activities unless absolutely necessary. The primary goals of the support facilities are to ensure that the work of the Assignment Team (is not disrupted by administrative issues and that all inputs are delivered in a timely and efficient manner. We identify three levels of backstopping – technical, operational and financial – which are described in more detail in the following sections.

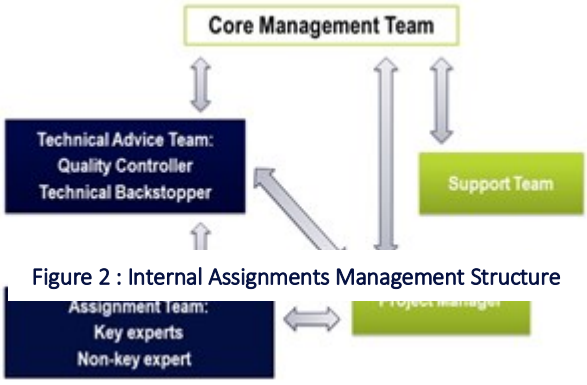


Figure 2 : Internal Assignments Management Structure

The backstopping facilities will be ensured at various levels in the Assignment organisational structure. The Backstopping Team will be operational on a permanent basis throughout implementation and will comprise:

The **Core Management Team** (comprising the Framework Manager and the Technical Director) will retain overall and final responsibility for the Framework Agreement and the quality of services delivered and outputs produced during this Assignment.

A **Project Manager** will be nominated at headquarters and will assist the Core Management Team in day-to-day coordination and management of the Assignment on behalf of the consortium, representing the primary interface between the consortium and the Contracting Authority in all matters pertaining to the proper and efficient fulfilment of contractual obligations. The **Technical Advice Team** of in-house staff will provide technical advice and support, as well as

quality assurance services, under the supervision of the Core Management Team.

2.3.1 Technical backstopping

Technical backstopping concerns the technical aspects of Assignment implementation. It is possible that questions of a highly specific technical nature may arise. In such circumstances, the Assignment Team would be expected to refer to the Core Management Team (as the main contact point) and the Technical Advice Team for technical support. As part of its strategy to ensure effective, efficient and successful implementation of the Assignment, the consortium has established sound and solid internal procedures to ensure technical quality and compliance of deliverables in line with EIB procedures and guidelines and any applicable local requirements. This is achieved through continuous communication between the Contracting Authority and the Assignment Team, so as to anticipate problems and bring solutions before issues become impossible to solve.

A specific Quality Controller and Technical Backstopper will be selected from within the Technical Advice Team for this Assignment and will work under the supervision of the Core Management Team:

- The **Technical Backstopper** will be in charge of: (i) Providing ongoing technical support during implementation (i.e. updating of methodology, technical brainstorming, preliminary review of reports, etc.); (ii) Monitoring respect of the timeline agreed for deliverables; and (iii) Representing the front office vis-à-vis the experts to enforce best practices according to internal procedures.
- The **Quality Controller** will: (i) Prepare the Quality Plan; (ii) Review in detail the technical contents of the deliverables; and (iii) Ensure enforcement of the Quality Plan.

With an annual turnover of more than €80 million and a full-time workforce of over 1,500 permanent staff, SUEZ Consulting (SAFEGE) combines good financial stability, excellent technical skills, and real know-how in project management. Our staff hail from over 50 countries, speak a combined 25 languages, and have specialised expertise in the infrastructure sector and/or international project management; together, their technical capacity covers the full spectrum of implemented projects. In the environment sector, we have scores of in-house technical staff who can intervene in the areas of project planning, management and evaluation, budgeting and team leading.

2.3.2 Operational backstopping

Operational backstopping relates to the internal management of the Assignment by the consortium.

Its primary goals are to ensure prompt mobilisation of the Assignment Team and permanent assistance to the Team during implementation.

A designated in-house **Support Team** (comprising a project assistant,

an IT manager and an **accountant/financial controller** who are permanently based at the consortium premises in Brussels) will provide day-to-day administrative and operational support, which will include:

- Making appropriate contractual agreements with the Key experts;
- Mobilising experts and providing all logistical assistance during implementation (arranging accommodation and/or travel as may be required, etc.);
- Arranging office accommodation of a reasonable standard and size for each Key expert;
- Ensuring that the experts have all equipment necessary for the mission (e.g. laptops, communication equipment, etc.);
- Transferring funds on a regular and timely basis to support the work under this Assignment;
- Ensuring appropriate translation services to deliver high-quality outputs in both languages and to ensure smooth communication during meetings, presentations and other events;
- Providing sufficient administrative and secretarial support to enable the Assignment Team to concentrate on their primary responsibilities; and
- Proofreading, formatting, printing and submitting the reports in the required numbers of copies.

2.3.3 Financial backstopping

Financial backstopping means that the consortium fully appreciates that it is responsible for ensuring the sound financial management of the Assignment and in particular meeting the overall contractual obligations in a timely and efficient manner. This will include checking and monitoring budget consistency, invoicing and payment.

2.3.4 Internal quality control and knowledge capitalisation

SUEZ Consulting (SAFEGE) is certified under the **ISO 9001 Quality Assurance Standard**. This certification, awarded by AFAQ in 2005 and recognised through the International Quality System Certification Network, relates to planning, design, engineering and consultancy services in various sectors, including environment, water and wastewater. ISO 9001 will be rigorously applied by the consortium during the management of this Assignment and in the provision of quality assurance of deliverables.

The consortium is fully committed to quality and adheres closely to ISO's guiding principles:

- **Transparency**: All essential information regarding work planning, work in progress and final results should be made easily accessible to all interested parties and throughout all phases of the Assignment.

- **Openness**: We are fully committed to the engagement of the primary and secondary stakeholders in the Assignment. We will ensure that there is continuous communication and consultation with these stakeholders during implementation.
- **Knowledge transfer**: We will endeavour to ensure knowledge transfer and the sharing of professionally relevant information. This Assignment includes a significant amount of inputs from regional and international experts, so knowledge transfer is certain to take place given the overlap of the numerous experts' working schedules.

Since it is not possible to factor out all risks during Assignment implementation, it is of utmost importance to ensure that effective risk management procedures and quality assurance processes are set up to minimise the occurrence of risks and to quickly and effectively manage risks that do occur. Overall, our quality assurance process is guided by three main principles: coordination, participation and competence. It implies several steps as well as the use of specific tools: active involvement of all actors in the process, information sharing, checking compliance, proofreading, formatting, etc. All Backstopping Team and Support Team members will actively participate and contribute to the implementation of the quality assurance process.

The **Quality Controller**, assisted by the **Assignment TA Coordinator/Team Leader** and under the guidance of the **Core Management Team**, will prepare a specific Quality Plan based on the Quality Management System for Framework Agreement implementation, the Assignment terms of reference, the proposed methodology, and other specificities of this Assignment. The Quality Plan will be the baseline for the quality assurance of outputs during implementation. The **Quality Controller** will also monitor the day-to-day implementation of the Quality Plan to ensure, as a minimum, that all outputs conform to EIB visibility requirements, are correctly translated, and are delivered according to the agreed timeline. This also involves ensuring that the internal project management systems are in accordance with the standards specified in the quality assurance certification, that there are clear channels of communication with the stakeholders, and that all actions are transparent.

Each output produced will be subject to internal quality control prior to submission to the Contracting Authority. The **Assignment TA Coordinator/Team Leader** will prepare a preliminary draft output, with inputs from relevant Key and Non-key expert, which is then sent to the **Quality Controller** for technical comments and suggestions and to the **Project Manager** for a preliminary administrative compliance check. Once finalised, the final draft output is sent to the **Core Management Team** for final technical and administrative review and endorsement. A final edit and format check is performed before the deliverable is submitted to the Contracting Authority. A one-page control path will be inserted into each report (unless different instructions are given by the Contracting Authority), which will sum up all persons involved in the preparation of the output and the internal quality control process.

We are fully aware of the critical importance of the timely delivery of outputs produced during the Assignment.

A clear internal time schedule for implementation will be drawn up by the **Quality Controller** and **Technical Backstopper** under the supervision of the **Core Management Team**. The time schedule will include, *inter alia*: (i) Date of internal transmission of the preliminary draft outputs to the Quality Controller; (ii) Deadline for internal comments on the final draft; and (iii) Deadline for the submission of the output to the Contracting Authority and receipt of comments. The internal time schedule will be set in a way to enable timely submission of outputs according to deadlines.

Timing, sequence and duration of proposed tasks

Major milestones

Task 1: Diagnosis: description of the current emergency response system in the region (Months1-3)Baseline report on the risks and status of the emergency system in the Varna region is completed

Task 2: Benchmarking with best practice examples of similar scale regions in the EU and identifying gaps in terms of organization and equipment. (Months 2-4)3 Workshops with regional authorities and other stakeholders are organised, to present main gaps, potential improvements, case studies and elements proposed for capacity building and investments

Task 3: Developing the Regional Disaster Risk Management Plan (Months 4-7)
1 Workshop with regional authorities and other stakeholders to present the plan is organised

ANNEX 1: Work plan FINANCIAL DIMENSION

Technical and Financial Operation Management plan

EXAMPLE OF A **BULGARIAN WATER CO -BGWco** (Anex)

Assessment of qualification needs of the personnel of WATER ADMINISTRATION is done against proper technical and financial management of operations based upon proposed organisation scheme. As almost all BG water companies are public non-profit organisations. For these kind of organisations a common method of setting efficient operational targets is

Benchmarking

Metric benchmarking: quantitative comparative assessment that enables water utilities to track their internal performance over time and to compare their operation against their past performance levels or that of other similar utilities;

- **The ratios thus produced can be very reliable indicators of performance over time within the given Utility when they are well defined, applied consistently and set in the proper context.**

Process benchmarking - identification of specific work procedures in need of improvement

This is done by using a "process mapping" technique; such a technique involves a step by step analysis of the identified process and then identifying

external examples of excellence in the process. This allows for standards to be set and steps taken to try and improve a company's performance.

Process benchmarking is usually performed at a higher level than metric benchmarking and is less numbers intensive.

As benchmarking has developed into a recognised technique, a common methodology has evolved. This is based on the order in which things need to be done to prepare the management plan.

The Planning Stage

- Select the subject area(e.g. water supply system or WWTP, etc.)
- Define the process components
- Identify potential partners (for some external services)
- Identify data sources and select appropriate collection method

The Analysis Stage

- Analyse data and select partners
- Determine the gap compared to the benchmark
- Establish process differences
- Target future performance

The Action Stage

- Communicate to management and others personnel
- Adjust targets and develop improvement plan
- Implement
- Review progress and calibrate

Below some key performance indicators (benchmarks) are given:

Operational benchmarks

Water production: m3/ day. Total annual quantity of water supplied to the distribution

system, expressed as an average over the year in m3 per day.

Water and wastewater quality compliance. Number of water production and waste

water effluent samples per year that comply with the respective quality standards.

Expressed as a percentage of the total number of samples taken in the year

Water consumption: litres/person/day. Total annual quantity of water **sold** to customers/ population supplied, expressed in litres per person per day.**Non-Revenue Water (NRW).** Difference between the water supplied to the distribution network less the quantity of water sold divided by the quantity of water supplied to the distribution system, expressed as a percentage. . By using the parameter '**water supplied into the distribution network'** it will enable like for like comparisons to be made for benchmarking purposes. Process water used for water production will vary depending on the treatment process and therefore will distort values if included in the NRW calculation.

Managerial benchmarks

Population coverage. Percentage of the population connected to the water supply and the waste water network.

Percentage metered customers. Not being metered, meaning having to pay bills that

are based on assumptions or averages, may lead to high dissatisfaction.

Population served per employee An indicator of manpower efficiency. It considersthe population connected to the water supply network divided by the number of employees providing water and wastewater services (including support staff).

Financial benchmarks The financial benchmarks represent the most basic indicators of financial health.

They are based on standard ratio analysis of the financial statements obtained at each company. They demonstrate three categories of financial conditions, namely, *profitability, liquidity* and *solvency. These indicators are separated from any financial indicators that might be used in project analyses, investment decisions, or operating cost analyses.* The benchmarks have been chosen since they give a general idea of the company's financial health and indicate its *a priori* ability to undertake and finance a project. Also, if the benchmarks are presented over time (e.g. during the last three years), trends become apparent (for example, the days of receivables may have increased, indicating a worsening ability for the company to collect revenues and generate cash). It should be noted that the selected benchmarks are appropriate for the current conditions faced by the water companies in BG. Few of the municipal companies, for example, currently have long term debt due to its social functions (low water price), historical reasons (they previously were part of the local government and operated as budget organizations) and financial reasons (local private banks are usually reluctant to give to the municipal sector long term loans).Therefore, some typical solvency indicators, while important, are currently not pertinent. Likewise, Indicators such as there returns on equity are interesting only in the economic sense, since the shareholders of the companies are mainly public bodies and the shares are not listed on a public stock exchange.

Operating profit before depreciation and concession fee/total sales : Indicates how well the firm covers operating costs with sales before allowing for other

costs (including finance, taxes, and extraordinary costs). A negative % indicates that sales do not cover current operating costs. A comparison can be made with net profit margin, which is net profit/total sales.

Current Ratio: Accounts receivable/accounts payable. Indicates the ability to pay current liabilities

based on the amount of current assets. A ratio > 1 is normally aminimum.

Days Receivables: Receivables/(annual sales/365). This ratio indicates how manyincome days are necessary to turn a sale into cash. A small ratio (<30) indicates a liqu identerprise.

Days Payables: Payables/(operating costs/365). This ratio indicates how long an enterprise typically takes (in operating cost days) to pay its creditors for materials, etc.

Allowances for depreciation are not included in operating costs. A large ratio (> 90)indicates **that the company may be behind in payments or enjoys easy credit terms withsuppliers.**

Total debt/total assets measures the percentage of total funds provided by creditors.

Debt is defined to include both current liabilities and long term debt. This indicator gives an idea of the company's financial structure. 20% is normal: no company exists without(commercial, banking, fiscal) debt, while 50% is a maximum allowable.

Cost Benefit Analysis (CBA)

The objective of CBA is to identify and monetise (i.e. attach a monetary value to) all possible impacts of the action or project under scrutiny, in order to determine the related

costs and benefits. In principle, all impacts should be assessed: financial, economic, social, environmental, etc. Traditiona lly, costs and benefits are evaluated by considering the difference between a scenario with the project and an alternative scenario without theproject (the so called "incremental approach"). Then the results are aggregated to identify net benefits and to draw conclusions

on whether the project is desirable and worth implementing. To that extent, the CBA could be used as a decision-making tool for assessing investment to be financed by public resources.

Technical Operation management plan

This part of our paper presents a selection of major relevant technical-

managerial parts of Technical and Operational management plan for Varna BGWco and covers among others:

- Asset management
- Leakage reduction and control
- Water quality monitoring
- Standards of services and levels of services
- Energy management
- Guidelines for operation and maintenance

Details on some of these topics will be found in appendices of this document.

Asset Management

BGWCo needs now and in the future potentially significant investments to:

- upgrade an aging and deteriorated infrastructure, including underground pipelines,water and wastewater treatment, pumping stations and storage facilities;

- meet new regulatory requirements;- serve a growing population;- improve security of services BGWco has not been generating enough revenues from user charges and other localsources to cover their full cost of service.

As a result, utilities have deferred maintenance and postponed needed capital improvements.

IPA/SAPARD reconstruction projects help a lot in solving of these problems but there will be always a need for good asset management.

To address these problems and help ensure that Utilities can manage their needs cost in the future effectively, comprehensive asset management is needed. KP Knin will have an imposing and valuable portfolio of assets, mainly underground in the form of pipelines and sewers, pumping stations and water storages water and wastewater treatment plants which require considerable investment to meet the customers' demands for service. After IPA/SAPARD reconstruction project the value of the assets will be much bigger than now. The future challenge calls for changes in managing these water and wastewater assets, with a more "businesslike" approach, where customers needs are considered, thus ensuring that assets can sustain agreed Standards of Service.

VARNA BGWco is faced with the substantial challenges of having to simultaneously:

- **Provide for the urgent rehabilitation and replacement of the ageing abstraction system at water source and pumping station at VARNA IUG, and**

- **Upgrade of their water tariff system to comply with the current and future drinking water supply and wastewater collection**

and treatment services, with cost-covering prices as requested in the Bulgarian Directives on minimum prices of water services.

If this challenge is not taken up and achieved within a reasonable timeframe, to arrest the deterioration of the existing

and new water infrastructure and change the present asset management culture to a modern performance

driven organization, the vicious cycle of lack of funding and deteriorating operational effectiveness will continue.

To avoid further deterioration, funds must be secured and allocated to rehabilitate the

facilities that are in the state of emergency or need performance improvement. More detailed assessment of the state of the facilities is required to achieve effective forward planning. The cost-covering tariffs system must be respected. The role of Varna BGWco where it as social institution subsidized its services must finish. This social role has to be return to the municipality of VARNA and province county.

Asset Management Plan (AMP) is a structured approach to minimise the life-cycle

cost of assets while maintaining required service levels and sustaining the condition of the

water supply and wastewater assets. It is a performance based business approach to

improving service levels and can helpVARNA BGWCo to achieve several important objectives:

- Target investment effectively and efficiently
- Improved service reliability
- Regulatory compliance
- Increased productivity and competitiveness
- More meaningful financial planning and reporting
- Visibility for underground "buried assets"
- Ability to justify investment requirements to funding agencies

Asset management plan of BG WCo needs to balance long-term needs

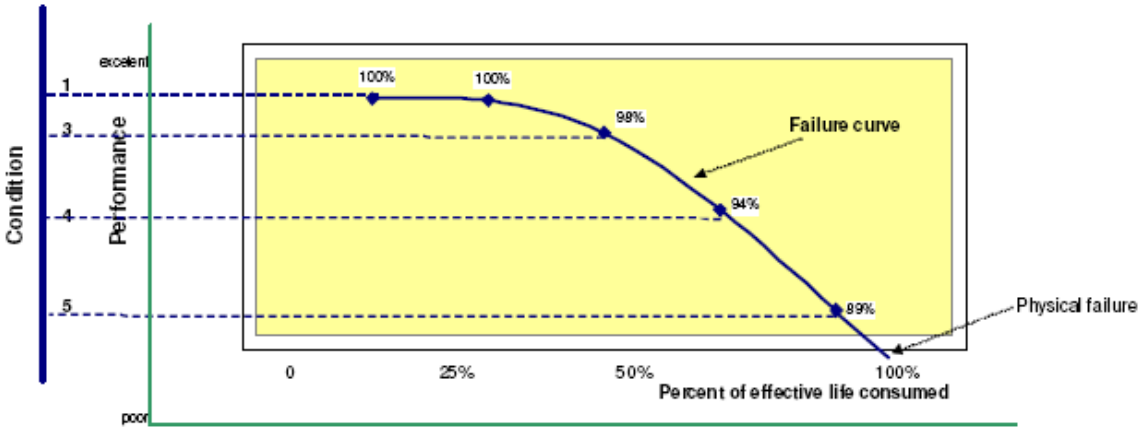
against short-term benefits. The basic elements of asset management plan are:

- *Collecting and organizing detailed information data base on assets*: age, size, construction materials, location, installation date, condition, logbook(failure and repair), expected and remaining useful life; assets' value, cost, depreciated value, and replacement cost. A potential example of setting of data base is given hereunder.

Asset name	Group	Code	Inventory no.	Accounting Code	Location	Physical and Technical data	Age	Condition	Failure incidents *(date, type of repair, cost, etc)*	Remaining useful life	Criticality Index	Acquisition cost	Depreciation	Current Value *(actual value including maintenance and repairing costs)*	Replacement cost

- *Analyzing data to set priorities and make better decisions about assets:*

Life-cycle cost analysis: besides the initial purchase price differences in installation cost, operating efficiency, frequency of maintenance and repairs are to be considered. As it is visible from the under given graph the asset failure number are genera lly not linear with age and it depends on quality of maintenance.



Risk/criticality assessment :defining critical assets for operations, considering both the likelihood that an asset will fail and the consequences—in terms of costs and impact on the VARNA BGWCo 's desired level of service—if the asset does fail.

 *Integrating data in MIS and GIS and its regular update***.**

 Addressing infrastructure needs to water service goals, operating budgets, and capital improvement plans. Decisions on asset maintenance, rehabilitation and replacement are linked to the organization's short- and long-term financial needs and are reflected in the operating budget and capital improvement plan, as appropriate.

 Development and monitoring of Operational Performance Indicators- OPI:

- Failure Incidents Rate: Number of repairs per km of water network (per year); Number of sewer blockages per km of sewer network (per year)
- Non Revenue Water: Percentage of water supplied into the distribution network not invoiced to customers
- System Renewal / Repair Rate: Percentage network replaced
- Unplanned Interruptions Rate: Number of unplanned interruptions / total no. of interruptions per year; Number of beneficiaries affected by (% / Year)
- Operating and Maintenance Rate: Planned Operating and Maintenance Cost / Operating and Maintenance Cost; Operating and Maintenance Cost / Total Costs

Asset management is a continuous process that guides the acquisition, use, and disposal of infrastructure assets to optimize service delivery and minimize costs over the asset's entire life

Reasons for asset management

Effective Asset management is a way to target the points in the system where spending is crucial to manage operational and financial risks associated with potential asset failures – thereby optimizing spending to keep the system working reliably and customers satisfied.

Knowing the condition of assets, and knowing where to prioritize rehabilitation and replacement spending helps utilities preserve assets, maintain reliable service, and understand long-term financial needs and will be therefore supported by the public and elected officials.

With regard to underground assets it is very difficult to monitor deterioration and implement timely maintenance and renewal. The collection of operational data in a systematic recording system will allow that networks performance can then be established. It is important that the system operators and managers, who know and understand the history of the operational systems play the major part in this process.

Benefits of asset management.

The benefits of asset management include, but are not limited to, the following:

 Better affordability for future repairs and replacements

 Better operational decisions

 Improved emergency response

 Increased knowledge of what assets are critical

 Increased acceptance of rates

 Capital improvement projects that meet the true needs of the system

Challenges in asset management

There are a number of key challenges for asset management:

 to determine the condition of current assets and plan new asset needs

 managing the assets information efficiently

 successful implementation requires cultural change/departments sharing information

 efforts to focus on long-term planning can conflict with short-term priorities

Current situation

Asset information in BGWco is held in several departments of the company. For example:

 Finance: for the valuation of assets and for depreciation calculations for the annual accounts

 Operations:

- water databases used to hold “water pumped” and pump data
- wastewater databases maintenance and repair event data
- mechanical and electrical emergency and planned maintenance system
- pipe work repair

Some information are hold by Municipality of Knin and Sibenik County Council

- engineering services record, municipal and regional drawings and digital maps

- regional mid- and long-term development plans including existing infrastructure data

The datasets are not complete. Not all of the data is held electronically. Many historical data are in possession of individuals, often retired, and not available to the company. For most of the KP Knin, the current maintenance procedures are only applied to keep the main components of the system (water supply or wastewater) functioning. There are no long term planned and sometimes not even clear maintenance procedures, only servicing rules being set in place.

For asset management purposes, the basic information on assets should be completed

with asset valuation, condition and criticality. Data collection is a continuous process and VARNA needs to remain consistent in gathering data and updating their central asset inventory as they repair, replace, or add infrastructure. Regular updating ensures that the information remains useful over time.

Key elements of asset management

 Level of service: means reliable services, delivered at a minimum cost, consistent with applicable environmental and health regulations

 Performance goals: means performance measurements and specific measures to achieve these goals: e.g. “water will be delivered to customers 99% of the time”.

 Asset identification and valuation: GIS data will be aggregated and linked for

financial, economic, technical and management use; GIS information transferred to MIS

 Condition and performance assessment: develop templates for above ground assets (wells, reservoirs, pumping stations, etc) and subjective assessment estimation for underground assets (transmission mains, distribution mains and the sewerage systems) - based on the analysis of the repair and capital repair information held in the GIS/MIS operational repair databases.

 GIS Information system should include some or all of:

- up-to-date system maps
- inventory of assets, including age, capacity, major construction materials,

  historical cost, condition and performance
- information related to identified structural and non-structural defects, including

  type of defect, severity, location, and date of discovery
- records of routine preventive operation and maintenance activities, including

  type of activity, location, date, and labour, material, and equipment costs
- inventory of maintenance facilities and equipment, including replacement parts
- results of inspections and tests for new or rehabilitated system components
- schedules and budgets for routine operations and maintenance activities and

  planned rehabilitation and replacement projects
- regular data transfer/exchange to/with MIS

 Rehabilitation and replacement planning: goal - to find the point in the asset's life cycle where the cost of replacement is balanced against the accelerating cost to maintain it with a declining level of service

 Financial management: forecasting over a long term period, annually updated

 Continuous improvement with periodic review of systems against performance measures to identify any shortfalls

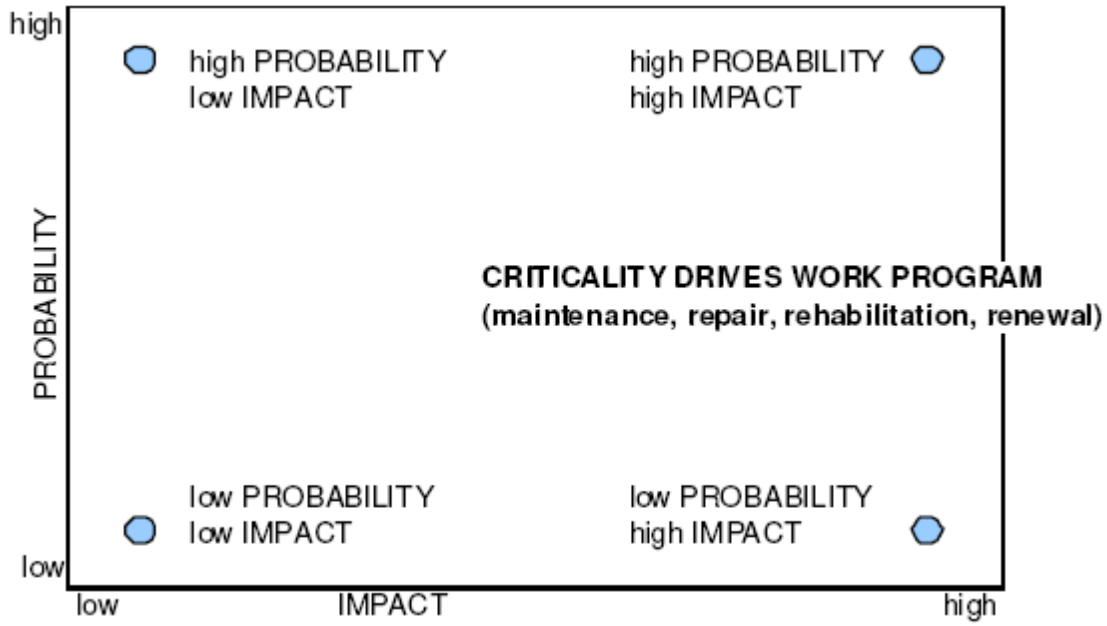
 Maintenance analysis and planning to improve system performance and preserve asset condition as long as possible and minimize costly emergencies

- Operational Performance Indicators (OPI's) should be developed and monitored

to understand the reasons and factors effecting the performance

- Maintenance, rehabilitation & replacement should be based on Criticality criteria, condition assessment and OPI's

- Criticality criteria should be developed in order to identify the importance of the individual asset to the operation of a BGWco: e.g. "water will be delivered to customers 99% of the time". As the BGWco system has only one water source, the source will be a critical asset for the system and it must kept operational permanently in order to meet this criteria.



These elements should be implemented by everyone in the KP Knin organization, involving

management, financial, engineering, administrative and field staff.

Asset Management System

The Asset Management System primary function is to enable a utility to manage

its infrastructure and plant assets based on an Asset Management Plan.

Main steps to develop an Asset Management Plan

- Develop asset inventory
- Assess assets condition
- Complete data on maintenance and repairs
- Calculate remaining useful life
- Valuation of assets
- Calculate criticality index
- Establish Operational Performance Indicators (OPI)
- Establish Level of Service (LOS)
- Determine life cycle costs
- Plan O&M and capital investments
- Complete and regularly update Asset Management Plan

For most utilities, information is most efficiently managed by use of asset management software programmes

that help organize the data, perform many standard analyses, and facilitate planning, scheduling, and budgeting.

These programmes range in cost and complexity from affordable, simple applications to complex, expensive solutions. A number of commercial applications are modular,

so that basic systems can be enhancedand expanded over time. By IPA provided GIS will be good starting point for developing AMS.

This approach helps control up-front hardware and software costs and makes it easier for staff to master new systems, thereby reducing the margin for error during transition.

Criticality assessment principle of assets is given with next picture:

Leakage reduction and control

Leakage of water from water networks of BGWco is huge (higher than 65% Non-Revenue Water NRW). There are several reasons for this: non adequate maintained network, hilly configuration of the city of VARNA with old (some network parts older than 100 years), and missing proper technical elements on the network, like pressure release valve, flow control valves, and air-release valves. As a consequence, particularly due to hilly configuration of the city of VARNA, this leakage is also creates high energy cost due to pumping of NRW. Leakage control is a reflection of the professional approach to the total management of the system and must be reduced to an economically viable minimum. Leakage can occur from reservoirs, transmission mains and most commonly, distribution systems. Leakage control is an essential component of distribution system management.

Benefits for VARNA BGWco of active leak control

 It minimises leakage and reduces the loss of water and costs;

 It results in an overall reduction in water demand;

 It reduces operating costs through savings made on energy and chemical usage;

 Work is planned and the need for emergency responses minimised;

 Dangerous leakage is minimised e.g. freezing water on roads;

 Customer perception about BGWCo will be improved;

 Capital expenditure on VARNA IUG PS & treatment, reservoirs and mains is reduced;

 Reduced risk of contamination from groundwater and wastewater;

 Sewer movement/destruction and infiltration is reduced.

An active leakage management approach should also target private pipe work through encouraging customers to repair defective plumbing systems speedily.

Factors affecting leakage

There are several factors that affect leakage from distribution systems and these can be summarised as follows:

Pressure

To high network pressure is one of the most important reasons for high leakage rates. Pressure increment of only a few metres can contribute to significant increases in system losses and burst frequencies. Lowering the pressure has positive effect on leakage reduction. Higher pressures will also make leaks occur earlier than they otherwise would have done. As there is no pressure release/control valves there is in general too high pressure in KP Knin network what causes higher leakage. Also some transportation mains (high zone Kninsko polje) are used as distribution pipes what has high pressure and respective high leakage rates house installation problems as a consequence. After IPA network reconstruction in KP Knin that includes installation of proper technical measures (network repairs, pressure release valves, flow control) and by using of network computer modelling to define minimal needed network pressure for end users, it can be expected that leakage will be substantially reduced.

Pipe deterioration

Usual deterioration problem is corrosion. The most used pipe material in Knin are AC (ca.87% of primary and secondary network) followed to less extent with some steel pipes and ductile iron pipes. Corrosion of concrete or asbestos cement pipes can be caused by soils or waters containing high levels of sulphates. Usual deterioration problem of metal pipes and fittings is the internal or external corrosion. Internal corrosion is generally more severe in soft water areas. External corrosion can arise from a variety of causes including differential aeration, bimetallic corrosion, variations in concentrations of dissolved salts in the soil, microbiological action and from contaminated ground in brown field sites.

Poor quality of materials and workmanship

It is important that appropriate specified standards are used for materials and installation is properly supervised. All pipes should be tested before commissioning to highlight any defects. It is also important that all materials are handled with care and stored appropriately.

Soil movement

Among the causes of soil movement are changes in moisture content, changes in temperature, frost heave and subsidence. Movement of the soil may cause a pipeline to break, joints to move, or result in local stress concentrations within the pipes or fittings that eventually lead to its failure. This is however not the case in Varna.

Soil leakage detection characteristics

The permeability of the soil in which pipes are laid can hide the leakage. In some soils, water from an underground leak may show on the surface fairly quickly whereas similar leaks in soils such as chalk can run indefinitely without showing.

Traffic loading

Where pipes are installed in heavily trafficked areas care should be taken in selecting the most appropriate pipe material and in trench reinstatement.

Stray electrical currents

Stray electrical currents can cause corrosion to unprotected metal.

Leakage control methods

There are six methods of leakage control. Five of these involve leakage location and pressure control can be considered supplementary to each of the other methods. **Pressure control**

Leakage reduction by pressure control is probably the simplest and most immediate way of reducing leaking

within a system as detection of leaks is not involved. There are a number

of ways of reducing pressure such as:

Valve control of pressure and/or zoning

The simplest and cheapest way of reducing pressures. Involves closing or throttling valves within the system which has the effect of reducing the carrying capacity within a network or placing a zone on a lower pressure supply(fire fighting limitation!)

Reducing pumping heads

This technique has limited application but well worth considering where demand in an area

has reduced. Benefits will be realised through reduced energy costs at pumping stations, due to lower heads and flows, as well as reduced network leakage losses. To achieve the full benefits of energy cost reductions, pumping equipment will need to be resized or at least pump impellors modified.

Pressure reducing valves

The use of pressure reducing valves is the most common way of lowering pressures in

distribution networks and thereby reducing leakage levels. Various types are available,

those that produce a constant differential pressure from inlet to outlet, those that deliver a

constant downstream pressure and those that can produce a variable downstream pressure

that enable night-time pressures to be lowered.

Pressure reducing valves are versatile they can be sensitive in operation and prone to failure due to air-locking and should be installed with a bypass facility.

Routine or regular sounding

Leak Noise Correlators (LNC's) have been generally used in survey of networks once or twice a year, depending on available manpower resources. This method can be refined with the division of network into a number of sub-areas and recording the number of leakage related repairs within each sub-area. Sounding is then prioritised and directed based on repair rates to enable more effective use to be made of manpower and equipment.

District Metering

As this name implies, meters, or a combination of meters, are used to measure water

consumption in a specific area of a water network. Meters need to have an integrating

capability and be able to be connected to data loggers. A District Meter Area (DMA) should ideally consist of about 3000 properties (an apartment = one property). All inflows to and outflows from a DMA must be capable of being measured. The number of meters should be minimised for cost considerations and in this respect boundaries should be established using closed valves. Once DMA's have been established it is necessary to establish norms for activating leakage activity. This, after preliminary leakage control of district(sounding), should establish average flows and minimum night-lines. Once set up in this way, data from DMA meters should be accessed weekly initially. In districts that prove to be stable this frequency can subsequently be reduced. Work trials demonstrated that District Metering could be justified as a method of leakage control in the majority of systems.

Subdivision Metering This method is similar to previous and also known as Waste Metering method that isolates sections of the distribution network through shutting valves such that an area is fed through a single feed. A waste district would typically contains ca.1000 properties in an urban area but it in general it is dictated by the network configuration. Ideally a waste district should be capable of being supplied for a 24 hour period to enable information to be obtained for peak, average and night time flows. Monitoring of waste districts should be carried out on a 3 to 6 monthly basis depending on manpower availability. Triggers for activating leakage location will be when the established norms for minimum night-line flows are exceeded. This can then be followed up by Step testing the Waste District. (described below).

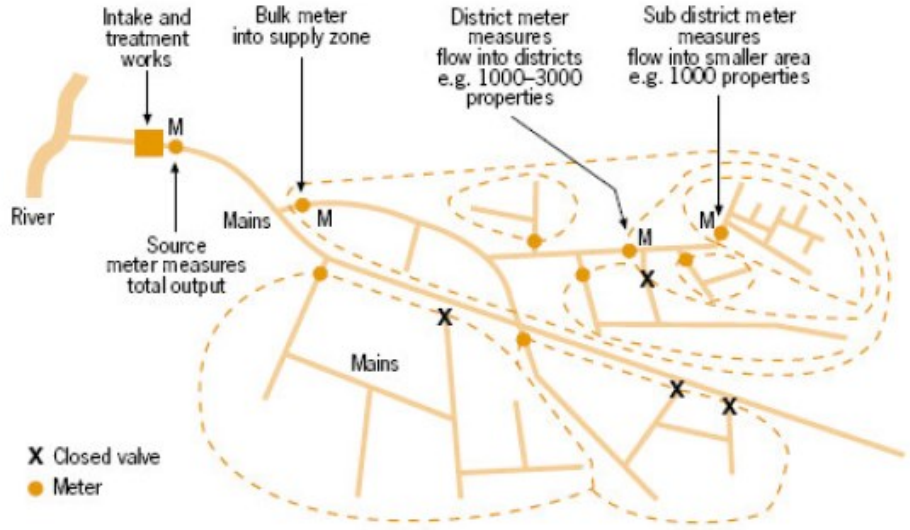


Figure: Example of District and sub-district metering

Step testing-The principle of the technique is to systematically reduce the size of the District by closing valves on each main in turn and noting the change in flow rate on the meter. A disproportionately large drop in flow rate indicates the probability of a leak in the section isolated. There are two methods of carrying out step tests.

The traditional method is to progressively close valves, working back towards the meter, and then reopening the valves when the test is completed. This method is less popular nowadays due to supply interruptions. A more recent approach, helped by developments in metering and data logger technology, is to use a series of short steps, isolating sections of the waste district for a short time only. This technique requires a remote meter reading device with a transmitting facility (either radio or mobile phone) located at the meter.

Flow rates are transmitted to operators who can immediately see the results of valve closures and can more speedily see the effect and thereby reduce the period that valves need to be closed. With the advances in data logger technology, step testing can also be applied in DMA's with certain configurations.

The main disadvantages of step testing, in the UK at least, are cost and regulatory. Step tests require night time working at premium time rates with associated recuperation time requirements. There is the need to forewarn customers of planned supply interruptions and this is time consuming and expensive. There is also the risk that step testing may cause bursts on week mains and discoloured supplies.

Combined district and waste metering

This method of leakage control consists of a combination of the previous two methods. District meters are used to monitor large areas, typically 2000 to 5000 properties, and when increases in flow rates are detected, waste meters located downstream are used to more precisely locate the location of the leak. By suitable selection and sizing of meters, both waste and District Meter Areas can coincide.

Leakage from reservoirs

Leakage from reservoirs can be minimised by regular inspection of overflows, drainage systems and structural conditions. Other than regular inspection, it is unlikely that location of leakage from reservoirs will be cost effective as the methods available are either expensive or involve disruption of water supplies to customers. Other methods of location include:

 Visual inspection of full reservoirs using underwater robot to check for physical defects and in the mean time to remove accumulated sludge without interruption of supply;

 Drop testing with the reservoir totally isolated, this involves measuring drop in water level over a time period;

 Visual inspection of full reservoirs using divers to check for physical defects;

 Visual inspection of drained reservoirs when taken out of service;

 Injection of compressed air into under-drains with a few centimetres of water covering the reservoir floor;

 Excavation of reservoir embankments.6

Leakage from transmission mains

Transmission mains tend to be laid to a better standard than distribution systems but failures tend to be eruptive when they occur. Good metering, supported by regular inspection, will minimise associated leakage but location of leakage on transmission mains is problematic and can be expensive. Location methods include:

 Metering, including small bore by-pass metering and insertion metering;

 Gas tracer techniques;

 Over-flying thermal imaging.

Location of leaks

There are several ways in which a leak may be located, none are infallible and most rely on leaking water making a noise. In all cases operator skill is required in determining the most appropriate leakage location method to adopt and apply.

Varna BGWCo does not have any working leaks detection equipment at the moment.

Direct sounding

This is the most common way of determining to position of a water leak, by attaching a sound amplification device to a water fitting to pinpoint the location of greatest noise. There are two ways in which this can be applied. Firstly by sounding all valves, hydrants and selected stop taps in an area and the second by sounding all fittings.

Field trials have shown that the second method, although a lengthier process, invariably proves more cost effective than the first. By valve and stop tap isolation, and the skill of the operator in recognising leak noise intensity, it is possible to hone in on leakages.

Surface sounding

Surface sounding consists of using microphones to measure the sound intensity of escaping water on the ground, directly over the line of the main where the point of maximum sound intensity indicating the probable position of a leak. It is successful in urban areas with hard surfaces but has limited use on soft surfaces such as verges or where excavations have been made and backfill has been imported.

Leak noise correlation

The leak noise correlator is a leak locating device that uses a cross-correlation technique that measures the time interval it takes for a leak noise to reach microphones connected to two points on a water main or service pipe. The correlator then pinpoints to potential leakage position. Its advantage is that it is unaffected by extraneous background noises.

For accurate location it is necessary to know pipe positions and its material. This equipment is particularly useful in urban areas of VARNA where there are a large number of access points such as valves, hydrants and stop taps. In rural areas, where such fittings are less frequent, it is necessary to drill down to the pipe and use metal bars to link to the microphones.

Gas injection

Gas injection and tracing techniques are used less frequently, since the previously mentioned methods of location are successful in most cases. The main application is for locating leaks that are difficult to find, particularly on non-metallic trunk mains and mains that operate at low pressures. The most common tracer gases used are sulfer hexafluoride (SF_6) and industrial hydrogen (95% nitrogen and 5% hydrogen).

Other techniques

Ground penetrating radar identifies changes in electrical and magnetic properties in the ground. It is a well established technique for locating underground apparatus and has now

been adapted for leakage location purposes. Its ability to detect differences in the density and water content of soils around pipelines enables it to identify leakage from mains.

Thermal imaging can be used in much the same way to detect the effects of ground

temperature changes brought about by water leakage. Both methods generally use an aircraft mounted camera and are particularly useful over-flying rural watermains.

In-pipe acoustic technology is now becoming an alternative to correlation in leakage location, particularly on larger diameter watermains.

Loss assessment Next terms are used for definition of water loss assessment:

Non-Revenue Water (NRW)

The current definition used in the world, is to express Non-Revenue Water (NRW) as a percentage of system input. This uses the simple formula***[(Volume of water supplied into the distribution network – Volume of water invoiced to allcustomers)/Volume of water supplied into the distribution network] x 100***

BGWco could have great benefit of reducing its huge NRW. There will be seasonal variations in the NRW calculation but what is important is that the input periods and billing periods coincide. To have more benefit of this NRW value it has to be elaborated further.

Water Balance A methodology for water balance has been developed by a special Task Force set up bythe International Water Association (IWA) and builds on the work done to date in formulating and guiding leakage reduction strategies. The water balance is based on actual measurements, or estimates, using the best and most reliable information available. Once the volume of NRW is established it is necessary to break it down into apparent losses and real losses. A good and accurate water balance requires a good assessment of the component parts, preferably through quantity measurements. (For the details look also at IWA web site).

<table>
<tr><td rowspan="8">System Input Volume</td><td rowspan="3">Authorised Consumption</td><td rowspan="2">Billed Authorised Consumption</td><td>Billed Metered Consumption</td><td rowspan="2">Revenue Water</td></tr>
<tr><td>Billed Un-metered Consumption</td></tr>
<tr><td rowspan="2">Unbilled Authorised Consumption</td><td>Un-billed Metered Consumption</td><td rowspan="6">Non-Revenue Water</td></tr>
<tr><td>Un-billed Un-metered Consumption</td></tr>
<tr><td rowspan="5">Water Losses</td><td rowspan="2">Apparent Losses</td><td>Unauthorised Consumption</td></tr>
<tr><td>Metering Inaccuracies and data Handling Errors</td></tr>
<tr><td rowspan="3">Real Losses</td><td>Leakage on Transmission and/or Distribution Mains</td></tr>
<tr><td>Leakage and overflows at Utility Storage Facilities</td></tr>
<tr><td>Leakage on Service Connections up to Point of Customer Metering</td></tr>
</table>

Unbilled authorised consumption

Un-billed metered consumption consists of customers who are supplied through a meter but are not charged for water used. This is by agreement with the water utility and can include some public buildings, fountains in parks and churches. Un-billed un-metered consumption consists of water used by the water utility itself for flushing purposes, water for fire fighting and water used for street cleaning. Installing meters for these uses is not viable and hence the volumes can only be estimated.

Apparent losses

Apparent losses comprise unauthorised consumption, metering inaccuracies and data handling errors.

Real losses: The determination of real losses has two components, those that are unavoidable and those that are potentially recoverable. The latter is affected by four criteria for a successful leakage strategy:

- Speed and quality of repairs;
- Pressure management;
- Infrastructure management;
- Active leakage control.

Losses Assessment methods

Infrastructure Leakage Index ILI

The most recent real loss indicator as developed by the IWA is the

Infrastructure LeakageIndex (ILI). This is a measure, in purely technical terms, of how a water network is

managed for the control of real losses at its current operating pressure. It is the ratio of

Current Annual real Losses (CARL) to Unavoidable Annual Real Losses (UARL):

ILI = CARL/UARL

To determine CARL and UARL and subsequently the ILI it is necessary to have the

following system data:

Q_B Billed authorised consumption

Q_{NB} Unbilled authorised consumption

Q_L Volume of water losses (m3/yr) $Q_{RL} + Q_{AL}$

Q_{RL} Real losses (m3/yr)

Q_{AL} Apparent losses (m3/yr)

Q_{SIV} System inflow Volume (m3/yr)

Q_R Registered flow (m3/yr) $Q_B + Q_{NB}$

C_n Number of connections

L_n Total network length (km)

L_c Total length of connections (km)

P_m Average network pressure (metres head)

Q_S Supplied flow (m3/yr) $Q_R + Q_{AL}$

T Time water supplied during day (hours/day)

The representation for CARL is:

$CARL = Q_{RL}/C_n$ (m3/year/connection)

The representation for UARL is:

$UARL = [(A \times L_n) + (B \times C_n) + (C \times L_c)]P_m$ (litres/day)

For the calculation of ILI, CARL and UARL have to be converted into compatible units,namely **litres per day per connection**.

A, B and C are constants that have been derived from the results of an international surveyof water networks. A = 18, B = 0.8 and C = 25.

Some European ranges of ILI - INFRASTRUCTURE LEAKAGE INDEX :

UK	6.5
Kosovo	23.0
Austria	6.6
Croatia	17.0
The Netherlands	0.6
Italy	12.0
Bulgaria	**17.7**

Network leakage per kilometre (LKM)

It is also necessary to consider the technical condition of the network in terms of leakageper km length of a network. This is given by the following formula:

$LKM = Q_{RL}/L_n$ (m3/year/km)

Economic Leakage Index (ELI)

Assess the economic value of acceptable water losses. This is done by relating the Economical Index (EI) to the Losses Index (LI) through the following relationship:

ELI = EI x LI

EI- is assigned a value based on the network system configuration as follows:

1.5 – water in the system receives two stage treatment and pumps into the network at a minimum pressure of 50 metres.

1.0 – water in the system receives two stage treatment, but gravitates into the network or, only requires disinfection but is pumped into the system (as in VARNA BGWCo).

0.5 – water in the system only requires disinfection and gravitates into the network.

LI = LKM/3600

For ELI application the following classification is used:

ELI > 3.5 A network where the water losses cause significant economic operating losses and where the operator should focus on leakage reduction.

2,5< ELI < 3.5 A network where water losses do not cause significant economic operating costs.

ELI < 2.5 A network where water loss levels are acceptable and where further investment in water loss reduction would be not be economic.

Use of computer models

There are number of low cost or free software packages that can be obtained from the

internet to assist utilities in developing a water balance.

Some useful sites are:

- LeaksSuite - www.leakssuite.com
- Aqualibre – www.wrp.co.za
- WB-Easy calc – www.liemberger.cc

Methodology for assessing network condition

From the performance indicators a methodology that will assess asset performance and hence prioritise VARNA network rehabilitation needs can be established. This methodology links water loss indicators to asset condition thereby driving network rehabilitation programmes in an objective way.

The performance indicators to be used are:

- Non-Revenue water (NRW)
- Leakage per kilometre of network (LKN)
- Infrastructure Leakage Index (ILI)
- Economic Leakage Index (ELI)

Based on the assessed values of the performance indicators the water network can be condition categorised based from very good to unacceptable. Five categories are recommended for comparative purposes. These are:

Category 1 – C1 - (very good) - Optimum condition of the relevant indicator. No special measures are necessary to improve this indicator.

Category 2 – C2 - (good) - Low level of risk of the relevant indicator. No special measures are needed to improve this indicator.

Category 3 – C3 - (average) – Average value of the relevant indicator. No measures needed to effect improvement other than planning to cater for a potential deterioration.

Category 4 – C4 - (critical) – Critical value of the relevant indicator. This is a trigger to implement corrective action to bring about improvement.

Category 5 – C5 - (unacceptable) – Unacceptable condition requiring immediate action to improve performance of the relevant indicator. An indication that action should have been taken retrospectively.

A range of values in VARNA for the existing network are mainly in category C4 and C5 except for the part that are recently renewed and need to be improved.

Management, organization and implementation

The key steps for VARNA to establish a proper organizational and managerial set-up for NRW are:

 Have staff with the right skills and knowledge

 Appropriate equipment

 Management commitment

Managers of VARNA BGWCo should see NRW management as part and parcel of good operating practise, understand the main characteristics and give a commitment to its required

activities, including the making available of resources. This should be supported by

permanent reporting of results. The water utility needs to be realistic in what it targets to achieve as over-optimistic plans are likely fail due to inadequate resourcing.

The specialist NRW position in VARNA can be drawn from future department of water supply but also request:

 Co-ordination between water production, distribution, commercial, customer service;

 Co-ordination with Bulgariaan Waters, Varna municipal authorities, county councils;

 Knowledge of network operation;

 Skills in leakage location techniques;

 Data collection skills and reports on progress;

 Carrying out network repairs;

 Network inspection, location of leaks;

 Monitoring of performance(SCADA, GIS), collection and processing of information,

liaison with commercial/administration departments, reporting;

 Network maintenance, repairs of identified leaks.

Water quality monitoring

Water and environmental quality monitoring is crucial for the environmental improvements that current IPA investment are intended to achieve.

At this moment there are several regularly water quality monitoring programs executed for BGWCo, regulated by BG low on Water, 47/2008:

- Drinking water quality
  - Water supply system VARNA IUG
    - A type analysis, 5 networks points, 2/month, total 100 /year
    - B type analysis, 5 networks points, 4/year, total 20 /year
  - Water supply system Kovac
    - A type analysis, 2 networks points, 0,5/month, total 12 /year
- Water source quality
  - Water supply system VARNA IUG
    - C type analysis 1/year

        - B type analysis 3/year
    - Water supply system Kovac
        - C type analysis 1/year
        - B type analysis 2/year
- Wastewater quality
    - untreated wastewater at sewer overflow to Varna Lakes treated effluent from WWTP Kovac, 4/year

Drinking and source water analysis are showing regularly good water quality. The quality of wastewater ie logically above MAC but also the effluent quality of WastWater treatments Plants (WWTP) are above the MAC values for treated wastewater. There is no monitoring of Varna lakes water quality before sewer overflow so that influence of untreated **wastewater can not be quantified**.

WWTP of essential measurements equipment for good process control (e.g. there is no influent flow meter and oxygen concentration meter). Instruction manuals for operations as well as for the maintenance are very poor and not sufficient for good operation. The existing drawings of are not providing enough information on the construction and process.

There is, based on this situation no complete understanding of staff There are also some technical, equipment problems like overheating of the blowers in the summer period, probably combined with some failure in fine-bubble aeration system (blocked or broken aerators) and control of the flow of return sludge - RAS system. Sludge wasting is, based on the supplier instructions, not done regularly with a consequence that SRT- sludge age time is getting very long (SRT >>40 days) causing sludge mineralisation and reduction of sludge activity. Without technical control of WWTP and proper measurement of process parameters on which the process of treatment could be controlled, there will be not possible to have controlled, good purification process in WWTP and reach good effluent quality.

Therefore it is suggested to BGWCon to, besides compulsory installing oxygen meters in the nitrification reactors and check technical status of all equipment, also to use laboratory of the faculty in VARNA, to regularly measure sludge characteristics: SV- sludge volume, SVI-sludge volume index, MLSS- mixed liquor suspended solids, ODS- organic dry solids, ash content of sludge. By solving all technical issues and using these sludge data for the process treatment control, .

Feasible targets for the water and wastewater quality monitoring have to be set, based on certain principles, such as: new organisation structure, best value for money (e.g. good WWTP process operation based on measurement) and compliance with legislation and standards in force in Bulgaria.

The monitoring system to be used for both WWP (new and old) of BGWCo and water well VARNA IUG has to be built according to the QA model:

"Plan – Implement – Assess – Improve" .**It is essential to nominate a person in charge for data quality issues, and for this works it seems logical to engage the technologist from future wastwaterPlant (WWP). QA in the analysis laboratories (internal and external) is an integral part of the quality management process and involves two components:**

 A system containing specific procedures related to the execution techniques and stages;

 A system containing provisions concerning the professional skills of the operational staff

(evaluation of the knowledge on: the legislation in the field of the quality;

evaluation of the expertise generated by the practical activity, etc.).

The Quality System includes the organizational structures, the responsibilities, and

resources necessary to implement the quality management systems.

Errors and sources of errors

To avoid errors in new system of water quality monitoring one should be aware of possible sources. Some possible sources of errors in laboratory analyses are the following:

System errors: devices, reagents, calibration, sampling, calculation;

Random errors: instability of power supply or utilities, inadequate sample processing (possible for Knin), negligence or lack of professionalism. Sampling frequency is too low;

Inadequate selection of investigation sections (water intake, reservoirs, distribution

systems) or of significant indicators (possible for VARNA)

Methodology problems:

- Lack of sampling procedures containing provisions for conservation/ contamination sources, etc;
- Lack of performance characteristics for units and laboratories;
- Lack of QA procedures;
- Lack of standard sampling and analysis procedures . Inadequate reference materials.

In order to avoid such errors or distortions, internal or external audits are used.

Data processing and interpretation

This stage is particularly important and is a condition for the correctness of the conclusions

following the water and wastewater systems assessment and also for the efficiency of the

laboratory activity.

The processing-interpretation stage starts with the simple recording of the analysis results

and finishes by developing the monthly or annual reports.

Recommendations

As requirements for a functional quality management system, first of all the motivation and participation of the sampling- and laboratory staff is necessary, as well as team work.

Among the most frequently applied QA methods in the water quality monitoring field are:

 Guidelines and manuals for specific QA procedures for all the sampling flow;

 Systematic organization and application of QC procedures;

 Testing and inter-calibration programmes;

 Accreditation systems.

The following factors should be considered by VARNA when the quality requirements are discussed with the data user, in order to choose the analytical system:

** The maximum time frame between sampling and analyses, (stability of the sample); The maximum time frame between sampling and reporting of the analytical results(e.g. BOD5); Sampling frequency and total number of analysed samples; Collected/necessary volume of samples; Samples conservation elements; Automatised *in situ* measurements techniques; Samples transport systems; Accuracy of the analysis method; The cost for**

performing the analyses;□ The necessary reliability level;□ Sensitivity methods;□ Potential interferences;□ Samples pre-treatment and dilution techniques;□ Existing equipment and the possibility to adjust and extend towards the quality requirements imposed by the data user.

Recommendations related to the operators' role

In order to safeguard the health of the population, the water operators should undertake a **series of measures, from the perspective of water and wastewater quality monitoring**:□ An appropriate provisioning with sufficient and qualified personnel, and with appropriate laboratory equipment;□ The implementation of a Quality monitoring and Management System at laboratory level ;□ The implementation of occupational safety and fire protection systems;□ The development of a programme, sections, sampling frequencies and analyses in accordance with the capacity of the system;□ The calibration and validation through sanitary or inspection bodies;□ The verification of the potability and stability in important sections. With increased monitoring of water networks the role of laboratories will become crucial In the context of current trends of evident development of the activity monitoring systems for water supply and sewage-treatment plants, the role of laboratories in the surveillance of water quality on specific sections or the whole system increases considerably in the generation of data or infoinform.

Conclusion: **By correlating technological data or quantitative and economic data, it is possible to establish a picture of the system state at any time, as well as the evolving trends.**
By correlating technological data or quantitative and economic data, it is possible to establish a picture of the system state at any time, as well as the evolving trends.Although amount and quality of data are important, BGWCo should not overdue the water quality monitoring keeping in mind the extent of the effects of the monitored data and its sufficiency for population health protection (effected by water quality) and/or influence of errors on the environmental protection. Varna BGWCo should design the new water quality monitoring system based on optimal costs of operation and Bulgarian legal requirements.

MUNICIPALITY OF VARNA

Ecology and Environment Protection Directorate

The Ecology and Environment Protection Directorate delivers on the commitments of the Mayor of Varna Municipality in the field of national environmental legislation, participates in the coordination of activities in the implementation of projects and programmes at local level, aimed at environmental protection, resource efficiency increase, including the initiatives envisaged in the European Union's Circular Economy Package. It also supports the work of the Mayor through the activities of the **three specialized structural units - departments:**

Environment Protection Department

Organizes, coordinates and participates in the development, update and implementation of programmes, projects, strategies and contracts on environment management and protection. It also draws up annual reports on the implementation of programmes required by special laws in the area of environmental protection.

Assigns and exercises control over cleaning and maintenance of drainage channels, gullies and culverts on the territory of the municipality.

Issues, reissues, amends, extends, terminates or revokes permits for usage of water sites, which are municipal property, and permits for obtaining mineral waters- exclusive state ownership.

Carries out activities for management and maintenance of mineral water taking facilities. It performs inspections and control referring water abstraction permits issued by the Mayor of Varna municipality and compliance with the prohibitions in the protected mineral water sites.

Takes part in public discussions on Environmental Impact Assessment (EIA) and Environmental Assessment, fulfils the obligations laid down by the EIA Regulation and conducts procedures under Environment Regulations in relation to investment proposals.

Monitors ambient air quality and acoustic environment in the city of Varna and offers measures to improve them.

Observes the implementation of the events for ambient air quality improvement and compliance with the noise standards in various areas of the city, according to the General Development Plan of the city of Varna.Carries out and supports implementation of information and educational programs and campaigns related to environment protection. Collaborates with NGOs.

Waste Management Department

Issues certificates for directing construction waste and excavated soil, and exercises follow-up control

Determines routes for trucks when transporting construction waste.Approves Construction waste management plans when issuing a building permit and/or at the opening of a construction site, and monitors reporting in accordance with the provisions of Waste Management Act, Spatial Development Act and Construction Waste Management and Recycled Building materials

Ordinance.Exercises control over sites for activities with ferrous and non-ferrous metals, paper and cardboard, plastic, glass, as well as compliance with other requirements laid down by the Municipal Waste Management

Ordinance.Controls implementation of projects and contracts for recovery, improvement and re-cultivation of agricultural land, disrupted terrains and municipal landfills.Controls over complaints and signals of natural and legal persons concerning waste management on the territory of Varna municipality.

Organizes campaigns to raise public awareness and culture in the field of waste management.

Control and Public Areas Cleanliness Department

- Controls the implementation of activities, reporting and payment to companies carrying out waste collection and transportation and public spaces cleaning, under contracts concluded with Varna Municipality.
- Exercises control under Waste Management Act and Varna City Council environment protection ordinances.
- Coordinates and controls biodegradable waste collection from restaurants, caterers and retail premises, including green biodegradable waste.
- Manages collection, use, disposal and landfilling of households repair work waste on the territory of the municipality.
- Exercises control over natural and legal persons, as well as over the company in charge of separate collection of municipal waste on the territory of Varna municipality.
- Carries out inspections and draws up responses and opinions concerning received complaints, signals and suggestions by natural and legal persons.

ANNEX 2: FINANCIAL ADVISOR

Back in 2014, Vanguard first conducted a study of the value of working with a financial advisor. At that time, the company's research showed that "[your] advisor not only adds peace of mind, but may also add about 3 percentage points of value in net portfolio returns over time." This was a revelation, coming from a company that espoused do-it-yourself, low-cost index investing. But why would Vanguard publish such a study? Why not keep it internal? I don't presume to have a window into the minds of Vanguard's marketers, but it has long been the case that financial advisors and planners, like this author, have used Vanguard funds. Contrary to what some investors believe, Vanguard is not the alternative to working with an advisor. Rather, Vanguard's funds are a viable

investment option for advisors to recommend to their investors, subject to suitability. I have met possibly hundreds of prospective clients who have chosen to draw this line between Vanguard and working with an advisor. No other company seems to stir such passion and commitment among some investors. But what is not known by these investors is that many advisors feel the same way, though they also understand that Vanguard does not have a monopoly on good ideas. Other fund companies provide mutual fund and exchange traded fund investments that may, or may not, offer better exposure to certain markets, better tax-efficiency, longer more consistent management, or an allocation better suited to a client. The role of the advisor is to help put forward the best and most suitable ideas from each company.

The primary focus of Vanguard's study was to highlight why advisors add value and those reasons include: Providing suitable investment recommendations;**;** Regular rebalancing of portfolios;**;** Developing spending strategies for retirement income; and Guidance to help adhere to financial plan.If you seek out a financial advisor who is both a fiduciary, meaning that they act in your interest, and a financial planner, you may very well increase your growth opportunities over investing solely on your own. You don't have to take my word for it. Take Vanguard's.

***PROF DR EMILE KARAILIEV-VANGUARD FUTURIBLES INTERNATIONAL 47 RUE BABYLONE 75007 PARIS TEL3315363370.** **To design the future of its city, a local authority must first define its goals, then identify and implement drivers for action, before assessing results in real time as part of a continuous improvement process, protecting environment and insuring financial equilibrium. . »** .

The issue of ensuring the financial stability of credit institution EIB (FSCI) after the crisis of 2008, 2020 has been updated completely in a new way, radically overturning the idea of this phenomenon and the methodology of managing it. However, the scientific community has paid attention primarily to the revision of the concept of financial stability at the macro and mega levels, taking into account the impact of such megatrends as information-and-network society, including the digital economy; internationalization of capital markets; demographic changes; deregulation of the financial sector. At the same time, insufficient attention is paid to the issues of ensuring the financial stability of financial institutions that creates a methodological gap between macro- and micro-level approaches of solving this problem. In addition, in practical terms, it leads to shifting responsibility for the credit sector financial stability solely to the level of regulators that, in our opinion, increases the level of moral hazard of financial institutions. Research analysis. Unfortunately, the existing studies on financial stability of credit institutions (FSCI) are fragmentary, and the process of its provision is often limited to the issue of its assessment, which, of course, is important, however, not the same. This is what actualizes the methodological importance as well as practical necessity of conducting systematic, complex studies of this problem. It is worth mentioning that the popularization of the systemic approach for studying (rather often it is realized by the network theory) is obliged to the synergetic paradigm that more and more substitutes the paradigm of determinism. It is considered that P. Anderson [1] and J. H. Holland [2] were the first who explains modular architecture of financial networks, studying the behavior of complex adaptive systems and their growth as a consequence of two competing feedback mechanisms in adaptive networks: hemophilia and homeostasis.

This theoretical approach to the financial system structure combines, on the one hand, the adaptive nature of the behavior of financial institutions based on the individual features of the evolutionary process through the use of the selective method of “trials and errors”, and, on the other hand, the process of self-organization that leads to a stable modular, scale-free architecture of the system that ensures, as a rule, the stability of routine behavior of the system, except for the cases of rare but strong shock effects Based on statements of L. K. Gallos a modular structure in natural as well as in

artificial systems appeared due to multicriteria optimization of stability, efficiency and ability of the system to grow What is more M. Girvan and M. E. Newman pointed out that many real natural and artificial systems exhibit a modular structure where nodes in small groups are more tightly connected to each other than the nodes in different modules of the network, which is the key to their behavior and functioning of the whole system The interrelationships between modules are relatively rare, but they are crucial to the functionality of the entire system, and quite often, the failure or breakdown of these links leads to a reduction or even a total malfunction of the system.

We agree with this affirmation of A. Karaev and consider it is important to describe the modular architecture of the credit institutions' financial stability ensuring and peculiarities of each module, theirs influence on the financial stability providing and long term retaining, their interconnection. The purpose of this article is to justify the methodological foundations for establishing a financial stability system of credit institutions. Research results. The development of system forming methodology for ensuring FSCI involves determining the nature of this system, the goals and targets of its functioning, object and subject composition, internal structure and scientific principles that determine its nature and peculiarities of its interaction with the external environment. However, it is necessary first of all to determine the scientific basis of the process of ensuring FSCI. The analysis of scientific theories, as a conceptual basis of FSCI managing, as well as author's conclusions about feasibility of their use, from the point of view of the effectiveness of achieving the objectives of financial stability, is presented in Table 1 Note that a system of ensuring financial stability of credit institutions is being interpreted as a set of methods, tools, activities, and their principles to be followed by the subjects of the system in the process of identifying, neutralizing and countering financial stability threats.

Table 2--Comparative characteristics of concepts of the theory of financial management in terms of expediency of their use as a methodological basis for ensuring FSCI Concept Target function of management system Management activities of an institution Advantages and disadvantages of implementing the approach The expediency of using as a methodological basis of ensuring FSCI * Priority of financial and economic interests of owners Growth of owners' welfare; key indicators: profit, dividends, earnings per share, return on equity Increase in market share, minimizing the cost of financial services, use of financial tools that accelerate cash turnover and help maximize profits Imperative execution of functions is leveled and considered as a specific way to meet one's own financial interest - profit. Focusing on profit growth encourages management to use financial strategies that allow take risks outside the institution, regardless of their feedback effect Inadvisable. EFSCI is reduced to preventing current insolvency by enforcing legislative norms and requirements. Financial stability is identified with the financial resistance of the institution

Valueoriented management Business value growth; quantitative indicators: a wide range of financial indicators that take into account the interests of various stakeholders Forming the basis for obtaining positive results of functioning of an institution in the long-term perspective, which in total provide an increase in its value Profit maximization is considered not as a goal, but as a condition for achieving the goals of long-term development of the institution. This management approach allows to unite all business processes of an institution into a single whole, consolidate the actions of managers and subordinates in order to obtain an integral result of their collective efforts - an increase in the value of the institution business

Advisable. Ensuring financial stability first of all involves creating prerequisites to the uninterrupted functioning of the institution on the conditions of the planned development. Herewith, profit is an important tool, but not the goal of ensuring financial stability of credit institutions, which closely correlates with the provisions of the value-oriented management approach, Cash flow balancing of incoming and outgoing cash flows; quantitative indicators: balance.