Assystem and the Future of Energy and Technology

As the human race seeks to correct some of its ecological and environmental errors of the past, we are seeking to develop cleaner and greener technologies to power our energy dependent lifestyles. The continued rise in energy demand due to economic growth, improved standards of living and urbanisation, can no longer go unchecked as the environmental damage is well documented. There is now an international effort to reduce CO^2 emissions and become carbon neutral, in order to protect our planet from the disastrous effects of global warming.

These efforts are driven by governments and pressure groups across the globe, commissioning treaties and agreements to be rolled out through policy and enterprise. Now we are starting to see progress with a revolution in the energy industry, as those with engineering innovations are transforming the sector for the future.

Assystem Radicon is a company that is at the forefront of this transition, as it pioneers low-carbon solutions for the energy industry across the globe. Assystem Radicon is part of an independent engineering group that operates in the nuclear, energy, healthcare, life sciences, transportation, defence and infrastructure sectors working on projects across the Middle East and the world. The company has over 50 years of experience providing industrial infrastructures with engineering services and managing projects that are complex in size, technological content and safety requirements. Assystem employs 6,000 people working in sixteen countries in Europe, the Middle East, and Asia.

This magazine had the privilege to talk with *Geraud Meyer,* CEO of Assystem in KSA - Assystem Radicon - about the projects and goals of the company, the conversation revealed a wealth of achievements.

What is Assystem's nuclear story and what are the benefits of nuclear power for the Middle East region?

Assystem is tasked to meet the challenges of the modern world and resolved to meet the world's increasing demand for energy while providing a reduction in CO^2 emissions. The company recognises that nuclear power is central to achieving these goals, in parallel to developing renewable energy sources such as solar and wind. As such, Assystem has grown to be the second largest nuclear engineering company in the world and is supporting the development of nuclear new build projects in Europe, the Middle East and Asia. The company is present in many of the countries that are actively developing nuclear energy program, including France, United Kingdom, Turkey, Finland, Saudi Arabia and India.

In the Middle East, Assystem has been working on the UAE nuclear programme for the past decade, establishing a local company, Emirates Nuclear and System Services, a joint venture between Assystem and Nama Development Enterprises based in Abu Dhabi. Assystem's expertise in the provision of project and construction management services as well as commissioning services, has been applied to the benefit of all stakeholders.

Assystem has also been instrumental in developing the Saudi nuclear energy programme,

working with K.A.CARE, the Saudi public body in charge of nuclear on the site characterisation parameters. These are key for the choice of the sites and will be used by the technology vendors to design their offers.

The benefits of developing nuclear energy for countries in the Middle East means that nuclear energy saves oils and gas that will be then available for exportation. Nuclear energy is reliable, competitive and produces carbon-free electricity, thus playing a critical role in the fight against climate change.

What challenges do you face in terms of public perception of nuclear power?

A country's investment in nuclear power is a long-term commitment by that nation and so strong engagement with the public at every stage of the journey is key from the outset of the project. Clear communication about major infrastructure investments such as nuclear helps citizens to understand that the power plant will not only deliver the secure supply of low-carbon electricity they require but stimulate a major jobs market around the plant that will benefit the country for years to come.

Nuclear power plants are subject to stringent regulatory frameworks, both domestic and international. Having 50 years of experience in nuclear, working with any technology provider across many countries means that Assystem has a very strong understanding of the specific context in which nuclear power is designed, built, commissioned, operated and decommissioned and the company is able to guide their customers through this process.

Assystem is today recognised as one of the most prominent consulting & engineering companies worldwide in the nuclear business.

Nuclear also had to prove its capability to be exported as a technology. The developments of the last decade, notably in the Middle East, have proven it is the case.

How does nuclear power help combat climate change?

Nuclear energy is increasingly perceived as a green energy that will contribute to the fight against climate change. Power generation through nuclear is CO^2 free, which is not the case of gas or coal-fired power plants. Around 40% of the CO^2 emissions worldwide represent the efforts of power generation and with an ever-increasing demand for electricity, there is no

option but to develop carbon-free decarbonised electricity. Nuclear power also works well

alongside renewables in the energy mix, acting as the secure and stable partner supplying baseload electricity to the grid, regardless of the weather conditions.

What renewable energy projects are being developed and how are you helping this industry be more effective?

The goal for 2030 is to have at least 40% of power generation from renewable sources, requiring an energy transition. Assystem is well positioned to support any energy transition project , such as wind farms, solar farms or H2 production. In addition to our design and integration capabilities we provide various services such as grid impact assessment, siting, EIA, HSE, QA/QC, portfolio management, PMO and construction management. Assystem accompanies their clients as their third-party owner engineers, as well as contractors. The engineering know-how from the Assystem team, powered by digital technologies pioneered by the company, is a real key to successful delivery.

How does digital transformation affect the energy sector?

Digital engineering is having a major impact on the safety, security and cost of energy projects today. Assystem has a deep understanding of how to support customers with their digitalisation and for many years we have invested in building our know-how through our excellence centre in Paris, where we developed our 'Engineering Powered by Digital Approach'.

In the energy sector, during construction phases, digital technology is rejuvenating the way projects are developed and thus changing the way project management and engineering are executed, taking advantage of new possibilities. During operations & maintenance phases, digital transformation considers the critical dimension of infrastructures and their obligation of service continuity.

Bringing together the physical world and the digital world of energy infrastructures, digital is enabling simulation and scenarios, leveraging the potential of data, for instance optimising production by anticipating breakdowns, or enabling the transition from document to data.

It is also a way to adopt ‘smarter’ work methods, develop solutions to improve productivity, create digital skills internally and attract new talent.

What digital platforms are you creating to assist in design, engineering and construction?

For supporting design, engineering & construction phases, we are developing platforms that incorporate engineering data (like PLM – Product Lifecycle Management), engineering models (MBSE – Model Based System Engineering) and platforms that support 3D models of the installation (like BIM platforms, Building Information Modelling).

Those platforms contribute to the digital continuity and the configuration management of the different states of the project. It assists in de-risking the project and will better prepare for the following phases of operations, maintenance and even dismantling of the infrastructure.

We are also integrating the most advanced project management or Project Portfolio Management (PPM) tools. This ensures a more accurate planning & scheduling of the activities, as well as the flexibility to define specific KPI to improve the project's control. Thanks to our expertise in BIM management, we can combine these tools and manage the projects through BIM 4D concept.

How is Assystem involved in developing the mega cities of the future?

Currently in the Middle East there are several mega projects under construction, where architectural masterplans meet ideological innovations, to create cities for the future. They will utilise modern technologies wherever possible, to become intelligent, carbon neutral and efficient places for future residents. These are perfect projects for the culmination of Assystem's capabilities, and we are involved in every stage of the development.

At the very early stages we offer essential consultation with siting services, including maritime, seismic, meteorological, geotechnical, hydrogeology and topographical surveys, as well as EIA studies. Then as the projects progress, Assystem also offers engineering services for the design and development of primary and secondary infrastructures such as roads, bridges, networks, utilities, and buildings; the company has already delivered more than 11-million man-hours for the development of industrial mega cities in Saudi Arabia.

Assystem also works to deliver turn-key services for facilities such as factories, administration buildings, residentials, educational, health and care buildings and utilities. The services we offer vary according to the need of the clients and can include design as well as project management.

The diverse range of industry experience and expertise from the Assystem team, means they can support also client's specific needs on a project, such as the automation of an industrial production line in an existing factory or the upgrade of the CCTV system of a city. Assystem has the capabilities to provide a broad range of solutions, empowering our clients to their greatest potential. For one client we created a bespoke robot to deliver e-cataloguing services,

for another we customised the use of BIM 4D and 5D to enhance the performance of design and project management services.

As an integration engineering consultant for complex projects such as nuclear plants, Assystem is also key player in renewable energies, such as wind and solar farms, H2 and its transportation and grid impact assessments.

Tell us a little of Assystem's plans for developing technologies for the future…

Assystem has engaged an initiative called 'Engineering Powered by Digital' to propose advanced services for improving the competitiveness of the services offered, the performance of the projects and being able to reach the optimal solution(s) in the ambient complexity. Whenever there is an opportunity to improve our efficiency and productivity with digital, we go for it!

This initiative is organised around three main principles: focus on the user experience and the main pain points, document to data transformation, system instead of disciplines approach. These main principles have driven four pillars of the Engineering Powered by Digital initiative as the following services: data science & artificial intelligences services, digital system engineering services, digital field services and project control services.

These services are operated by the Assystem Digital Engineering team, whose mission is to deploy those services & solutions for Assystem customers but also within Assystem's organisation (the engineering and projects teams but also group functions like HR, Quality & EHS, etc).

In Saudi Arabia we have already started the digital transformation and we have reached an advanced level. For example, all our design projects are delivered under BIM 3D, with automatic clash detection and some of them with 4D and 5D; we use artificial intelligence on a daily basis for enhancing our productivity, especially on repetitive tasks, data aggregation for our contractual and technical libraries and digital reporting for our sites' supervision.

Let's continue to look to the future and your goals for the company…

Due to the endeavours, projects and technology advancements that we have achieved over the last five years in the Middle East, we have proven our capability to support very important programmes such as the implementation of nuclear plants in UAE and Saudi, as well as the development of mega areas, such as the industrial cities of Jubail, Jizan, Yanbu, the iconic Alula, the futuristic NEOM and more. The company now has its sights on leveraging this reputation for larger involvement in infrastructure programmes and to become a strong regional presence for the development of renewables and transportation.
The objectives are tangible, as private enterprise and governments plan for the future but need the expertise and experience Assystem has to offer. Their ambitions are achievable, just as the power is there to be harnessed.

Thank you to *Geraud Meyer, CEO of Assystem Radicon ,* for sharing all this information and detail, it is clear that Assystem truly is one of the leaders in Saudi Arabia for infrastructure development, power and digital solutions.