

**Ultra Energy was critical to NuScale gaining development funding and regulatory approval for its SMR design**



**Customer**

**Developing and commercialising America's first small modular reactor**

NuScale's mission is to provide scalable advanced nuclear technology that will produce electricity, heat, and clean water to improve the quality of life for people around the world. Since its founding in 2007, NuScale has made significant progress towards developing and commercialising America's first small modular reactor (SMR). Called VOYGR™, its SMR will create an energy source that is smarter cleaner, safer, and cost competitive in relation to gigawatt-sized nuclear facilities.

**Challenge**

**Minimising development time and cost**

The science of generating power from nuclear reactors is well understood and related engineering is mature. However, NuScale's aim to radically reduce the size of plants and cost effectively deliver them to site pre-built introduced a range of high-risk engineering challenges. VOYGR's safety systems would be specific to it so could not be bought 'off the shelf'. Multiple first-of-a-kind engineering projects would need to be successfully delivered for NuScale to gain regulatory approval and launch its SMR commercially.

Creating VOYGR's bespoke systems meant NuScale would have to simultaneously coordinate multiple complex development programmes. Each



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had the potential to take a long time to complete and incur significant costs. While NuScale’s financial backers are highly committed, time and money are always finite. For VOYGR to gain the successive rounds of funding it needed, ambitious development milestones had to be delivered on time and its non-recurring engineering costs, the cost of developing systems for production manufacturing, had to be minimised.

**Solution**

**Rapid creation of requirements and new safety systems**

NuScale started working with Ultra soon after it began development work, as it recognised that we are uniquely placed to accelerate its progress. Ultra’s long and continuous experience in developing nuclear safety systems means we have suitably qualified and experienced personnel (SQEP) across our business. Our team’s unparalleled expertise gives Ultra an unrivalled ability to rapidly solve complex new safety challenges with innovative solution design, manufacture and integration.

Ultra was tasked to support NuScale across multiple high risk, yet mission critical development programmes. At the outset, our expertise was used to write their original systems requirements documents. Across the following years, we created further detailed requirements for multiple new safety systems, including in-core instrumentation (ICI), safety display and indication (SDI), neutron monitoring systems (NMS), module protection systems (MPS), as well as level and pressure sensors. During this time, we regularly augmented NuScale’s resource, with members of our team embedded on their site for extended periods.

Beyond writing documentation, NuScale leveraged Ultra’s design and manufacturing capabilities to solve novel safety challenges. Nothing on the market could simply be bought and plugged into place. While the principles were understood and some elements of Ultra’s solutions had been proven within other programmes so could be re-used, much was developed new. Ultra supported NuScale from our two main sites. Wimborne in the UK developed ICI, SDI, NMS and MPS solutions. Round Rock in the US focussed on pressure and level sensors.

**Benefits**

**Development milestones met to secure vital funding and regulator confidence gained for approval to launch SMR**

Because of Ultra’s long track record in nuclear safety and solutions



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development, NuScale knew we could rapidly create the new systems it needed, while leveraging what we had delivered before to generate time and costs efficiencies. By partnering with Ultra, NuScale minimised the risk associated with developing new systems and accelerated its progress as a start-up company.

Our experience, expertise and project methodology were core to giving NuScale a short cut to the right answers. Accelerating progress further, Ultra has SQEP in both the US and UK. When rapid progress was critical, we could leverage time zones to extend our working day, significantly reducing the time between programme milestones.

Ultra thrives in creating solutions that address our customers' specific challenges. This quality enabled NuScale to gain regulatory approval for a new model of nuclear power generation and bring it to market within a timeframe and cost that met the expectations of its investors.



"In designing the VOYGR™ plant, NuScale has achieved a paradigm shift in the level of safety of a nuclear power plant facility. It is a revolutionary solution to one of the biggest technical challenges for the current fleet of nuclear energy facilities. At NuScale we believe that safety comes first, second to none."

**Future**

**New era for nuclear generated low carbon power**

Having gained regulatory approval in 2020, NuScale announced its first commercial customer for VOYGR early in 2021. By the turn of this decade, it expects to have delivered six SMRs to Utah Associated Municipal Power Systems to support its Carbon Free Power Project. Ultra is proud to have been so closely involved in the company's journey to this important milestone. We look forward to its continued success, with many more NuScale SMRs delivered across the world to support our low-carbon energy future.



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## About Ultra Energy

Organisations working with nuclear technologies have a responsibility to safeguard people, the environment and infrastructure. We provide solutions that give our customers complete, long-term protection and control of safety critical systems, while helping them increase the net value derived from nuclear investments over their total lifespan.

Part of Curtiss-Wright, Ultra Energy has worked with nuclear customers for over 60 years. We're embedded in strategic national infrastructure and helping organisations develop future nuclear applications. We support continuous operation of nuclear sites with protection and control solutions that monitor and manage factors such as radiation, neutrons, temperature and pressure within safety critical systems.

## United Kingdom

Innovation House  
Lancaster Road  
Ferndown Industrial Estate  
Wimborne  
Dorset BH21 7SQ  
UK

Tel: +44 (0) 1202 850 450

## United States of America

707 Jeffrey Way  
Round Rock  
Texas 786665-2408  
USA

Tel: +1 512-434-2800

## For more information

Web: [ultra.energy.com](http://ultra.energy.com)  
Email: [info@ultra-ncs.com](mailto:info@ultra-ncs.com)

