Microreactor and Feasibility FAQ

Process

1. **What exactly is a feasibility study, and who is involved in it?**
   To determine the technical feasibility, location, cost, and how the plant will be operated to serve the CVEA area. The contributors to the study will be CVEA, USNC, and a local Alaskan engineering firm to ensure we have the best insights into any particular challenges of building in Alaska

2. **How long will the study take?**
   We anticipate the study will take approximately 4-6 months to complete.

3. **If everything goes well with the study what is the next step?**
   The next steps following a positive outcome of the feasibility study would be for
   - CVEA and USNC to define a financial framework for the operation and ownership of the plant
   - A detailed engineering study will be performed for siting the nuclear plant. This study will inform the process to obtain a license with the Nuclear Regulatory Commission (NRC) and the needed state permits.

4. **How long would it take to license the microreactor?**
   There is no set time to receive a license from the NRC. It is an extremely rigorous and time-consuming process which is it is considered to be the international gold standard for safety. USNC has already entered the licensing process with the Canadian Nuclear Safety Commission for a Micorreactor to be built by 2027. USNC has also recently begun the NRC licensing process for a Research Test Reactor at the University of Illinois- both of which should help build the case for this first civilian deployment.

5. **Does this project create any jobs for Alaskans?**
   There will be job opportunities created for both the construction and operation of the reactor. Additionally the Microreactor will deliver less expensive, and more reliable electricity and heat which will enable current and potential future new business and employment opportunities.

6. **Who would build the reactor?**
   The small size of the reactor allows for the nuclear power plant components to be built remotely, and will be taken care of by USNC. While there may be changes in the plant between now and the start of the construction, it is anticipated that the plant's physical assembling and construction will be subcontracted to an engineering and construction company.

Public Information and Input

1. **Will there be ways that the public can get involved and receive information?**
   Both CVEA and USNC will set a high standard for engaging the people of Alaska. We have already communicated broadly to a comprehensive set of stakeholders and will build upon this as the effort progresses.

2. **Will you do something besides using government requirements to involve the public?**
   Engagement is about more than simply gaining consensus or project buy-in, sharing information or 'checking a box'. For the CVEA/USNC partnership it will be about building a participatory space that allows room for diverse perspectives and new solutions to emerge.

3. **How do you plan to reach out to Native Alaskan village communities?**
   We have already begun this process and have had conversations with some of the key leadership in Native Communities and Corporations. We will continue this process and engage with communities on the terms they would like, from informal information sharing to formal collaborations.

4. **How is this project different from past nuclear efforts here that have failed?**
   We are well aware of the past incidents in Alaskan history which have negatively affected some communities. The lessons learned make clear that anything other than transparent and meaningful two-way engagement will likely not succeed, and we plan to take a different path.

5. **Will there be a website I can use to learn more about this project specifically?**
   The MMR technology is described at MMR Energy System (usnc.com)

Technology

1. **What is a microreactor? How is it different from the nuclear reactors we have?**
   A microreactor is a small nuclear reactor that can operate as part of the electric grid, independently from the electric grid, or as part of a microgrid to generate up to 50 megawatts of electricity or provide heat for industrial applications.

2. **Is this reactor safe, and why?**
   The MMR reactor is a truly walk away, safe power reactor. In the case of a fuel or cooling system failure, the MMR reactor cannot melt down as the temperature will remain at a safe level while heat dissipates passively into the environment

3. **Can the reactor meltdown?**
   The design of both the reactor and the fuel create a defense in depth from any malfunction of scenario where the fuel could melt down. It is simply not possible because the low power density, temperatures, and the incredibly high-temperature resistant material used for the reactor core prevent this from happening.

4. **Does the reactor produce nuclear waste, and what do you do with it?**
   The reactor produces nuclear waste. Once the fuel is exhausted, after no less than ten years of continuous operation, the fuel will be unloaded from the plant, placed in special casks, and left to cool down for 1-2 years at the plant side. After that period, it will be relocated to a temporary storage facility for several years while the US government will establish a permanent repository for nuclear-spent fuel.

5. **What kind of fuel is needed, and how often do you reload it?**
   The MMR reactor uses a special fuel called FCM (FCM® Fuel (usnc.com)). As per most of the known designs for fission reactors, the base of the fuel is enriched Uranium. Microscopic particles of enriched Uranium are covered with layers of carbon and silicon carbide to become what is known as TRISO (TRISO Particles: The Most Robust Nuclear Fuel on Earth | Department of Energy). TRISO is already a very resistant form of fuel that prevents the leak of almost any radioactive material outside. USNC has developed the FCM to increase further the safety characteristics of the TRISO fuel. In the FCM fuel, the TRISO particles are coated with Silicon Carbide-which has high corrosion and heat resistance properties and is the protective layer used for military for tank and body armor.

6. **How do you handle seismic issues, and will this be located near a fault?**
   Seismic considerations are one of the risk sources accounted for in a reactor design. The MMR is small and sited underground, which reduces the shear stress in the event of an earthquake. While the stress can be reduced, it cannot be removed entirely. In order to understand the potential effect we will undertake an analysis of the soil and historical data used to determine the earthquakes expected in that area. The engineers use this information to ensure that the plant can withstand such an event, and those conclusions are brought in front of the NRC, which will issue final determination of the assessment.

**Prepared by Ultra Safe Nuclear Corporation in partnership with Copper Valley Electric