3　説明書の交付　本公表に基づき応募する供給者に対して導入説明書を交付する。
⑴　交付期間　令和５年９月１日から令和５年10月２日まで。
⑵　交付場所　上記２⑵に同じ。
4　説明会の開催　本公表に基づく導入説明会を開催する。
⑴　開催日時　令和５年９月８日13時30分
⑵　開催場所　東京大学宇宙線研究所６Ｆスクエア
5　その他　この導入計画の詳細は導入説明書による。なお、本公表内容は予定であり、変更することがあり得る。
6　Summary
⑴　Classification of the products to be procured : 24
⑵　Nature and quantity of the products to be purchased : Hyper-Kamiokande pure water production and recirculation system 1 Set
⑶　Type of the procurement : purchase
⑷　Basic requirements of the procurement :
A　This system is for the production and purification of ultra-pure water for the 260,000㎥ ultra-large water Cherenkov astroparticle detector (Hyper-Kamiokande) to be installed at the Kamioka Observatory (in Shikama, Kamioka, Hida City, Gifu Prefecture) of the Institute for Cosmic Ray Research at the University of Tokyo.
B　This system is designed to realize the best water quality in the Hyper-Kamiokande tank by supplying ultrapure water and returning water from the tank to the recirculation system after the tank is full. Water purification using the recirculating system should be carried out to maintain water quality during the water filling period. The gas phase of the measurement tank and buffer tanks must be filled with radon-removed air to prevent radon gas from dissolving into the water. The following systems are required for these purposes.
①　Ultrapure water production and supply system
②　Purifying recirculation system
③　Radon-removed air production system
C　This water system should have pure water supply and recirculation roles and requires the necessary supply of radon-removed air.
①　Water supply to the Hyper-Kamiokande tank.
The system treats the raw natural spring water, continuously supplying processed pure water to a 260,000㎥ Hyper-Kamiokande tank. In this natural water treatment process, the removal of particulates and viable bacteria, removal of ions including uranium, thorium, and radium, increase in electrical resistivity, and reduction of radon shall be achieved.
②　Recirculation process through the Hyper-Kamiokande tank
After water filling to the tank is completed, the water in the tank shall be recirculated through the system tank to keep and further improve the water quality.
③　Radon removal air production system
A system for supplying radon-removed air to the top 1m layer of the Hyper-Kamiokande tank and other buffer tanks should also be included in this system so that radon does not dissolve in pure water due to contact with the air containing a large amount of radon at the site.
D　The capacity of each system should be the followings. Ultrapure water production and supply system ＞ 65㎥／h, Purifying recirculation system ＞ 155㎥／h (During recirculation operation) and ＞ 95㎥／h (During water supply operation), Radon-removed air production system ＞ 54㎥／h Conditions for system operation.
①　Continuous operation is possible 24 hours a day, 365 days a year.
②　Filters and other consumables necessary to supply water to a 260,000㎥ tank shall also be included in the procurement.
③　The Institute for Cosmic Ray Research, the University of Tokyo, conducts inspections once a day on weekdays but does not inspect them on holidays such as weekends and national holidays. If various manual adjustments are required, they should be able to be handled only during the above inspections.
④　Scaffolding and other facilities should be provided for safety and equipment protection during inspections and maintenance.
⑤　Design for easy operation and maintenance.
⑥　Have a support system that can respond quickly to system failures.
E　The quality of the raw spring water used is as follows.
Temperature 11.0℃, pH (25℃) 7.8, Conductivity 170μS／㎝, Turbidity ＜ 1 degree, Acid consumption (pH 4.8) 40.0mg CaCO3／ℓ, TOC ＜ 1mg／ℓ, Phosphate ＜ 0.1mg／ℓ, Nitrate 1.0mg／ℓ, Sulphate 36.4mg／ℓ, Fluoride 0.3mg／ℓ, Chloride 1.6mg／ℓ, Sodium 4.9mg／ℓ, Potassium 0.5mg／ℓ, Calcium 25.2mg／ℓ, Magnesium 15mg／ℓ, Ammonium ＜ 0.1mg／ℓ, Ionic silicon dioxide 17.1mg／ℓ, Iron ＜ 0.01mg／ℓ, Copper ＜ 0.01mg／ℓ, Zinc 0.09mg／ℓ, Lead ＜ 0.1mg／ℓ, Aluminium ＜ 0.01mg／ℓ, Boron ＜ 0.01mg／ℓ, Strontium ＜ 0.18mg／ℓ, Barium ＜ 0.01mg／ℓ
F　The ultrapure water supplied to the tank during the filling period must meet the following water quality.
Temperature Below 13℃, Electric resistivity 18MΩ・㎝ or more at 25℃, Microparticles 10 pcs／㎤ or less (Particle size 0.2μm or more) and 100 pcs／㎤ or less (Particle size 0.1μm or more), Germs 1 pcs／㎤ or less, Dissolved oxygen concentration 1ppm or less, Uranium concentration 0.001mBq／ℓ or less (By mass spectrometry), Radium concentration 0.001mBq／ℓ or less (see Note), Thorium concentration 0.0001mBq／ℓ or less (By mass spectrometry), Radon concentration 100mBq／ℓ or less (By the radon detector of ICRR, the University of Tokyo)
Note : For the radium concentration, it is acceptable to set the required water quality on the condition that three or more of calcium, magnesium, strontium, and barium, which are in the same family as radium in the element number table, are less than 1／1000 of the concentration in raw water.
G　In the recirculation process, the water quality at the outlet of the system must meet the following conditions : Temperature Below 13℃, Electric resistivity 18MΩ・㎝ or more at 25℃, Microparticles 10 pcs／㎤ or less (Particle size 0.2μm or more) and 100 pcs／㎤ or less (Particle size 0.1μm or more), Germs 1 pcs／㎤ or less, Dissolved oxygen concentration 1ppm or less, Uranium concentration 0.001mBq／ℓ or less (By mass spectrometry), Radium concentration 0.001mBq／ℓ or less (see Note), Thorium concentration 0.0001mBq／ℓ or less (By mass spectrometry), Radon concentration 0.01 mBq／ℓ or less (By the radon detector of ICRR, the University of Tokyo)