Signature: **EZP.270.23.2022** Otwock, 26.08.2022

Awarding Entity
Narodowe Centrum Badań Jądrowych
05-400 Otwock-Świerk
ul. Andrzeja Sołtana 7

With reference to the public procurement procedure, procedure is conducted by means of an open, called "**The Design, Manufacture and Delivery including installation of a helium cooling system for the Polish Free Electron Laser - PoIFEL at the premises of the National Centre for Nuclear Research in Otwock-Swierk".**

I. Pursuant to Article 135(5 and 6) of the Public Procurement Law Act of 11 September 2019 (Journal of Laws of 2021, item 1129, as amended), the Ordering Party quotes the content of the questions and provides explanations to the submitted questions:

Introduction to Questions:
Dear Sirs,

in order to layout and design the refrigeration system for

"The Design, Manufacture and Delivery including installation of a helium cooling system for the Polish Free Electron Laser – PoIFEL at the premises of the National Centre for Nuclear Research in Otwock-Swierk. … Procedure number EZP.270.23.2022":

Question no. 1:
The pressure loss across the shield pipes for the different operating modes – i.e. cooling mode, stand-by mode, nominal operating mode and warming mode?
Response no. 1
For the shield pipes, it is expected that each line (thermal shield supply and thermal shield return) will have a pressure drop not higher than 250 mbar for both the stand-by and nominal operating modes. For the warm-up and cool-down mode a pressure drop of 500 mbar per line is expected (in the worst case).

Question no. 2:
The return flow data – mass flow, temperature and pressure – of the 5K cooling cycle at the coldbox return inlet for the different operating modes?

Response no. 2:
The Awarding Entity understands that the question refers the parameters of helium flow in the He return line (return line from cooling of the cryomodules) in the modes when cryomodules are cooled down to the temperature of 5K. According the TOM III DESCRIPTION SUBJECT OF ORDER, section 6.3.1," Phase four" and section 6.3.2 "Phase three", strictly speaking, the cryomodules are cooled down to the temperature of about 4,3 K and the cold compressors at this time are not operating. For this scenario, it is expected to have a helium mass flow of 35 g/s in the temperature of 4,6K and a pressure of 1,1 bara at the inlet to the coldbox.

Question no. 3:
The return flow data – mass flow, temperature and pressure – of the 2K cooling cycle at the coldbox return inlet for the different operating modes?
Response no. 3:
The Awarding Entity understands that the question refers to the parameters of helium flow in the He return line (return line from cooling of the cryomodules) in the modes when cryomodules are cooled down to the temperature of 2K. This situation is possible only in the standby and nominal operating modes. For these modes, helium parameters at the coldbox return are the following:

a. stand-by mode: q = 11,6 g/s, T = 4,5 K, P = 0,027 bara (typically)
b. nominal operating mode: q = 35 g/s, T = 3,9 K, P = 0,027 bar

Question no. 4:
In case of an integrated purifier, the purifier can cannot operate in parallel to the cold compressors in the nominal operating mode, but only in the stand-by mode – however, switching from stand-by mode and parallel operation of the purifier and the nominal operating mode is instantly possible at any time without delay. In this respect:
Is it acceptable to have an integrated purifier running at times when experiments are paused?
Response no. 4:
The Awarding Entity has specified the functional requirements for the helium refrigeration system, at TOM III DESCRIPTION SUBJECT OF ORDER. It is the Economic Operator's task to design the system in such a way that it conforms to these requirements. As long as the helium needs of the PolFEL facility are covered, including the possibility of running it for prolonged periods in the nominal operating mode, it is the Economic Operator's decision and responsibility to employ a specific purifier solution.

Question no.5:
Which and in which quantities are impurities within the return gas are to be considered which is lead to the recovery system?
Response no. 5:
Helium will flow to the recovery system primarily in the situation when the pressure in the pipe increases above the allowed level. In this situation, the control valve will be used to divert the helium to the recovery line in a controllable manner to lower the pressure in the line and protect against the helium lost. Another planned application of the recovery line assumes its use as the return line in case of cooling only one cryomodule, when the rest of the CDS is already cooled down. Therefore, the quantity of impurities in recovery line will be the same as in the rest of the return lines.

NARODOWE CENTRUM BADAŃ JĄDROWYCH ŚWIERK
Dariusz Socha
Z-ca Dyrektora NCBJ
ds. Ekonomicznych

Dokument podpisany przez Dariusz Socha
Data: 2022.08.26 14:43:17 CEST

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(signature of the authorized representative of the Ordering Party)