



## Decision

**Matter of:** Cryo Technologies

**File:** B-406003

**Date:** January 18, 2012

---

Richard Hessinger for the protester.

Lauren Didiuk, Esq., and Mark Langstein, Esq., Department of Commerce, for the agency.

Christina Sklarew, Esq., and Guy R. Pietrovito, Esq., Office of the General Counsel, GAO, participated in the preparation of the decision.

---

### DIGEST

In a procurement for a helium refrigerator for a research laboratory, protest challenging a requirement that the refrigerator use gas bearing turbine expanders is denied where agency establishes that the requirement is reasonably necessary to meet the agency's needs.

---

### DECISION

Cryo Technologies, of Allentown, Pennsylvania, protests the terms of request for quotations (RFQ) No. SB1341-11-RQ-0650, issued by the Department of Commerce, National Institute of Standards and Technology (NIST) for a helium refrigerator for NIST's Center for Neutron Research in Gaithersburg, Maryland. Cryo contends that the requirement that the helium refrigerator use gas bearing turbine expanders is unduly restrictive of competition.

We deny the protest.

### BACKGROUND

In simple terms, a helium refrigerator operates by first compressing helium gas and then by expanding it to cool the helium gas. Turbine expanders are used to expand the compressed helium gas to reduce its temperature. See Protest at 4. The solicitation here, issued as a small business set-aside, sought quotations for a fully automatic 7,000 Watt helium refrigerator and required, among other things, that the refrigerator's expansion machine system use gas bearing turbine expanders of proven performance. RFQ at 8.

Cryo filed an agency-level protest with NIST, questioning why the requirement could not also be met by a system using an oil bearing turbine expander. In response, NIST confirmed that the agency required a system using a gas bearing turbine expander and that it would not accept an oil bearing turbine expander. Agency Report (AR) at 2; Tab 5, RFQ Questions/Answers. Prior to the closing date for receipt of quotations, Cryo protested to our Office.

## DISCUSSION

Cryo complains that the requirement for gas bearing turbines is unduly restrictive of competition.<sup>1</sup> The protester states that gas bearing and oil bearing turbine expanders are two types of expanders that are provided with helium refrigerators and liquefiers to industry and the scientific community. Cryo argues that both types perform the same function with no difference in efficiency or reliability and thus the agency has no justification for requiring gas bearing turbine expanders.<sup>2</sup>

Solicitations may include restrictive requirements only to the extent they are necessary to satisfy the agency's legitimate needs. 41 U.S.C. § 3306(A)(2) (2011). Where a protester challenges a specification or requirement as unduly restrictive of competition, the procuring agency has the responsibility of establishing that the specification or requirement is reasonably necessary to meet the agency's needs. See Total Health Resources, B-403209, Oct. 4, 2010, 2010 CPD ¶ 226 at 3. We will examine the adequacy of the agency's justification for a restrictive solicitation provision to ensure that it is rational and can withstand logical scrutiny. SMARTnet, Inc., B-400651.2, Jan. 27, 2009, 2009 CPD ¶ 34 at 7. Further, a protester's mere disagreement with an agency's judgment concerning the agency's needs and how to accommodate them does not show that the agency's judgment is unreasonable. Valor Construction Mgmt., LLC, B-405365, Oct. 24, 2011, 2011 CPD ¶ 226 at 3.

NIST states that, given how the agency will use the helium refrigerator, gas bearing turbine expanders are necessary to meet its needs. In support of this contention, NIST provided a detailed statement of a nuclear engineer at the Center for Neutron

---

<sup>1</sup> Cryo also speculates that NIST will improperly award the contract to a large business and that NIST's award will be inconsistent with the solicitation's evaluation criteria. We dismiss these complaints as speculative and premature.

<sup>2</sup> Cryo states that it is a small business and is the only American supplier of large helium refrigerators and one of only three commercial suppliers of these systems in the world.

Research, explaining how the helium refrigerator will be used and why gas bearing turbine expanders are required. AR, Tab 3, Statement of NIST Nuclear Engineer.<sup>3</sup>

With respect to how the helium refrigerator will be used, the engineer states that the Center is a national laboratory for research using thermal and cold neutrons. In this regard, the Center operates a 20-megawatt research reactor as a neutron source, both for studying the structure and behavior of materials and for fundamental physics research, neutron imaging, and nuclear chemistry. Id. at 1. The engineer states that, because the Center is in the process of converting the existing cold neutron source from liquid hydrogen to liquid deuterium, the new refrigerator will be used to cool the liquid deuterium cold source. Id. at 2-3.

With respect to the requirement for the gas bearing turbine expander, the engineer explains that there are three types of bearings available for this application: (1) gas bearings, which essentially use helium gas to lubricate the bearings; (2) oil lubricated bearings, which use a thin film of oil between the turbine shaft and the turbine housing; and (3) active magnetic bearings. The engineer states that gas bearing turbines offer a simplicity of design, high reliability, contamination-free operation (since there is no oil, and the bearing lubricant and refrigerant are the same substance), and maintenance-free operation. Id. at 4-5. The engineer states that the risk of contamination by oil bearing turbine expanders or turbine failure is unacceptable. In this regard, he notes that if the helium refrigerator were to fail, the entire reactor would have to be shut down, which would result in significant delays in research projects (both ongoing and scheduled) and increased costs. Id. at 9.

The agency's engineer notes that the Center's use of the helium refrigerator will be different from other larger refrigerators, which he states may use oil bearing turbine expanders. Specifically, the refrigerator required here will be used in a laboratory setting to cool a cold neutron source, as compared to more common helium refrigerators which are used to liquify helium or other gases. He states that the turbine expanders used in these other applications are much larger and less sensitive to small amounts of contamination, so that the use of an oil bearing turbine in those circumstances pose little operational risk. Id. at 10. The engineer also states that of the approximately dozen other cold neutron sources worldwide of which he is aware, all but one (which uses an entirely different mechanism) use refrigerators with gas bearing turbine expanders. Id.

---

<sup>3</sup> The engineer refers to the turbine expander as the "heart of the refrigerator," and describes it as "a shaft with pinwheel blades at each end." AR, Tab 3, Statement of NIST Nuclear Engineer, at 3. He explains that because turbine expanders operate by spinning very rapidly, special bearings are required to prevent any part of the turbine from making contact with the surrounding turbine housing, damaging or destroying the turbine. It is the specification for a particular type of bearing--gas-lubricated, rather than oil--that the protester challenges here.

We find that, as explained by its nuclear engineer, NIST has established that the requirement for a helium refrigerator with gas bearing turbine expanders is reasonable. Although Cryo disagrees with the agency's engineer, arguing that both gas bearing and oil bearing turbine expanders are highly reliable machines and that the consequences of failure are identical for both types of expanders, this disagreement does not show that the agency's judgment as to the need for gas bearing turbine expanders is unreasonable. A protester's disagreement with the agency's judgment concerning the agency's needs and how to accommodate them, without more, does not show that the agency's judgment is unreasonable. Exec Plaza, LLC, B-400107; B-400107.2, Aug. 1, 2008, 2008 CPD ¶ 143 at 5, 6. Rather, we find that NIST's explanation for this restrictive solicitation provision withstands logical scrutiny and is rational.

The protest is denied.<sup>4</sup>

Lynn H. Gibson  
General Counsel

---

<sup>4</sup> Cryo also contends that the agency's decision to set aside the procurement for small businesses was improper because there are no domestic small businesses able to satisfy the solicitation's requirements. Comments at 5-6. NIST responds that it is aware of several domestic suppliers of gas bearing helium expanders, AR, Tab 3, Statement of NIST Nuclear Engineer, at 5, and that its market research indicated that it could expect to receive offers from at least two responsible small business concerns at a fair market price. AR at 7.