

145606



Comptroller General
of the United States
Washington, D.C. 20548

Decision

Matter of: United Terex, Inc.

File: B-245606

Date: January 16, 1992

Cliff G. Russell, Esq., Starfield, Payne & Korn, for the protester.

Thomas L. Schoaf, for Adapto, Inc., Eric Sandquist, for Ainslie Corporation, and Sach Sinha, for Sach Sinha and Associates, Inc., interested parties.

Charles J. McManus, Esq., Jonathan H. Kosarin, Esq., and Sandra D. Baker Jumper, Esq., Department of the Navy, for the agency.

Linda C. Glass, Esq., and Michael R. Golden, Esq., Office of the General Counsel, GAO, participated in the preparation of the decision.

DIGEST

1. Protest that specification requiring a maximum tensile strength limit for suspension bands used to hold torpedoes on fixed-winged aircraft and helicopters is unduly restrictive is denied where agency states requirement is necessary to ensure the safety of personnel and aircraft and protester fails to show that agency's technical judgment is unreasonable.

2. Protest based on incumbent's experience, that an unspecified number of the products will not meet tensile strength specification because of the manufacturing process and will have to be replaced at the contractor's expense, and that other offerors not having its knowledge and experience might underprice the protester, does not render specification improper. The incumbent's failure to consistently meet the specification does not show that the specification does not reasonably reflect agency needs for the safest product achievable, and the record shows that other potential contractors are aware of the difficulty and risks of meeting specification.

DECISION

United Terex, Inc. (UTI) protests the specifications contained in request for proposals (RFP) No. N00104-91-R-K130, issued by the Navy Ships Parts Control Center. The solicitation is for 1,799 suspension bands used to hold the MK46 torpedo on fixed-winged aircraft and helicopters. The solicitation was issued on August 13, 1991, as a 100 percent

small business set-aside and contemplated the award of a fixed-priced contract to the low-priced offeror. Several offers were received by the September 12 closing date for receipt of proposals.

UTI contends that the adoption of a maximum tensile strength limit for these suspension bands is unduly restrictive and overstates the government's minimum needs. UTI also contends that the specification is misleading to potential offerors because no one with the exception of UTI has knowledge that the tensile strength range is too narrow for this material and will result in wasted production efforts.

We deny the protest.

The suspension bands wrap around the torpedo and hold the torpedo to the bomb rack. After the torpedo is released from the aircraft, the bands must disengage and spring away from the torpedo. The bands must work in aircraft which are repeatedly catapult launched from aircraft. The torpedoes also are often loaded and unloaded which also subjects the band to wear and tear. The suspension bands consist of several components including the strap assembly. This protest concerns the specification for the strap assembly which is to be manufactured in accordance with government specifications and drawings. The assembly is constructed of an alloy known as Inconel 718. The properties of Inconel 718 are altered by "cold working" and heat treatment processes. The solicitation specifies the heat treatment cycle required to age and harden the straps in a vacuum furnace; however, the amount of cold working is not specified by the government, but rather is left to the discretion of the vendor.

With respect to the strap assembly, the specification provides the following:

"The finished material must be able to be bent without cracking to the end shape shown on this print. After bending, the material must be able to be aged to a minimum tensile strength of 230,000 PSI (per square inch), maximum tensile strength of 250,000 PSI, and a minimum yield strength of 220,000 PSI using the heat treatment procedure from Note six."

Tensile strength is the greatest stress a material can bear without cracking. The solicitation also requires that the straps contain no cracks. The agency reports that as the maximum tensile strength increases, fracture toughness decreases (ability to withstand a crack-like defect) and the

critical crack size becomes smaller and more difficult to detect. A critical crack is defined as a crack that will lead to failure when a component is stressed to its fracture toughness design limit.

The Navy states that the maximum tensile strength limit to 250,000 PSI was incorporated in 1987, as result of an investigation of several fleet failures where cracks were determined to be the cause of the failure of the suspension band. The Navy reports that it was the conclusion of the investigation undertaken by the government and independent laboratory materials engineers and fracture mechanics specialists that the upper limit of 250,000 PSI was necessary to ensure personnel and aircraft safety. The Navy's review showed that above the 250,000 PSI maximum, the fracture toughness of the band decreased and that this caused the critical crack size to become smaller and, therefore, more difficult to detect. The Navy concluded that the inability to detect these small, but potentially dangerous cracks caused by exceeding the tensile strength maximum of 250,000 PSI posed an unacceptable risk to equipment and human life.

The Navy found, based on fracture toughness tests, that a crack of approximately 0.012 inches in depth could lead to failure when a band was subjected to repeated loading in the ocean environment in which the aircraft and helicopters are most often used. Consequently, the Navy determined that it was necessary to detect surface defects of at least 0.012 inches in depth. Since fracture toughness (and therefore allowable defect size) increases as tensile strength decreases for the band material, the Navy states it established the maximum tensile strength upper limit at a level that gave it confidence that any cracks which were missed by dye penetrant inspection (the means of detecting cracks not readily visible) would not lead to critical fracture.¹ Additionally, the Navy reports that the minimum and maximum tensile limits chosen were within the range which had been previously procured using the two known production processes for this item.

UTI argues that the upper limit of tensile strength overstates the agency's needs, because the specification already prohibits cracks and the problem of cracks can be handled by inspection. UTI also argues that firms cannot predict with accuracy whether its end product will be within the specified range because the processes of production as

¹The Navy reports that an investigation conducted in January 1990, also confirmed that as tensile strength increases, fracture toughness decreases and critical crack size decreases, making detection more difficult.

required by the Navy specifications, and the nature of the alloy used, make it difficult to produce a product within the specified upper limit. Accordingly, UTI maintains that other bidders will have to submit prices based on guessing how many of the items will not meet the PSI limitation and require replacement. UTI also is concerned that, as the incumbent, only UTI is aware of the risks involved in pricing this work and it will be underpriced by firms which do not price for the risks involved.

An agency is required to specify its needs in a manner designed to promote full and open competition. See LaBarge Prods., Inc., B-232201, Nov. 23, 1988, 88-2 CPD ¶ 510. Restrictive provisions should only be included to the extent necessary to satisfy the agency's minimum needs. The contracting agency which is most familiar with its needs and how best to fulfill them must make the determination as to its needs in the first instance. When a protester challenges a solicitation requirement as unduly restrictive of competition or as unreasonable, we review the record to determine whether the requirement has been justified as necessary to satisfy the agency's minimum needs. See PHH Homequity Corp., B-240145.3; B-241988, Feb. 1, 1991, 91-1 CPD ¶ 100. Moreover, where, as here, a solicitation requirement relates to human safety or national defense, an agency has the discretion to set its minimum needs so as to achieve not just reasonable results but the highest possible reliability and effectiveness. See American Airlines Training Corp., B-217421, Sept. 30, 1985, 85-2 CPD ¶ 365. We find the agency requirement here to be reasonable.

It is undisputed that these bands are used in a high stress application, in an environment which includes a corrosive, salt air atmosphere. In addition to being installed and removed frequently by fleet sailors, these bands must withstand the rigors and high shocks of repeated carrier landings and take-offs. A catastrophic failure could result in severe personnel injury or death and possible loss of aircraft. Thus, the agency's goal to minimize the potential for failure is obviously reasonable.

UTI does not argue, nor do its test results show, that the maximum tensile strength is impossible to achieve, or that the Navy's conclusion, based on investigation and contracting experience, concerning maximum tensile strength and its relationship to the ability to detect critical cracks is incorrect. There is no dispute that fracture toughness increases as tensile strength decreases. Further, cracks resulting from the manufacturing process or subsequent use of the item may be smaller and more difficult to detect, but nonetheless, ultimately lead to life and equipment threatening failure of the product. Accordingly, we think a specification which, by limiting tensile

strength, minimizes the potential for undetectable critical cracks, is reasonable. While UTI argues that it is more difficult and more costly to obtain consistently the maximum tensile strength at 250,000 PSI and that the requirement may result in substantial and costly waste because of the need to rework and replace nonconforming products, we do not think that because the cost and burden of meeting the specification may be significant, the specification is unreasonable in view of the agency's goal to ensure a safe product.²

UTI presents documentation in its comments that show that under a prior contract, it produced straps where 197,800 were tested and only one lot or 600 straps would have been rejected for failing to meet the maximum tensile strength required here. While UTI argues that this was merely "dumb luck" and that a rejection of only 600 straps would be extremely expensive to cure, the record shows that the maximum tensile strength required here is achievable. In our view, the agency has the right to set its minimum needs to achieve the highest possible level of safety. See American Airlines Training Corp., supra. Furthermore, we note that several offerors have commented on this protest. While they all agree that meeting the establishing minimum and maximum tensile strength will be difficult, they believe that these limits are achievable.

UTI also alleges that offerors cannot accurately predict or reasonably price in advance the effort necessary to comply with the maximum tensile strength limitation. UTI contends that it knows that there is a significant statistical probability that substantial number of points tested on the product will exceed the maximum tensile strength and that there is no way an offeror can possibly predict, quantify, and price these contingencies which are not within its control. UTI further contends that because it is the only producer with substantial experience in producing production

²UTI suggests that an offeror may propose to meet this maximum tensile strength requirement in anticipation of receiving a waiver of the tensile requirement. However, its concern here appears to be unfounded. The record is clear that the Navy has reluctantly waived the requirement in the past and has consistently maintained that the required maximum tensile strength is necessary to eliminate the possibility of undetectable cracks in the material.

quantities, it cannot cost its offer on the same assumptions as other potential offerors, and it is likely to be out-priced every time by offerors who do not have the same knowledge of the risks of performance.³

We are not persuaded that UTI's prior experience necessarily places it at an unfair competitive advantage. The Navy reports that with the proper alterations to the heat treatment and cold working processes, offerors can achieve the necessary results with minimal waste. The record also shows that potential contractors are aware of the difficulty in meeting this specification and the risks involved. Thus, if the protester is correct, and knowledgeable firms will price a waste contingency, the Navy is simply accepting the risk that it may pay more for a safer product, a position we find unobjectionable. Risks are inherent in procurements, and offerors are expected to use their professional expertise and business judgment in taking these risks into account in computing their offers. General Elec. Canada, Inc., B-230584, June 1, 1988, 88-1 CPD ¶ 512. The fact that an incumbent has not consistently met a specification does not establish that the specification does not reflect the agency needs. See Talley Support Servs., Inc., B-209232, June 27, 1983, 83-2 CPD ¶ 22.

The protest is denied.



for James F. Hinchman
General Counsel

³UTI also contends that because it has successfully produced suspension bands without cracks at tensile strengths higher than the maximum tensile strength required here, the Navy, at least with respect to UTI, is overstating its minimum needs. The fact that UTI with its particular material handling process allegedly produced straps with no detectable cracks, even at a maximum tensile strength of more than 250,000 PSI, does not mean it meets the agency's minimum need for a more effective means for detecting or eliminating critical cracks. Nor does it establish that the Navy's requirements are unreasonable.