White

The Comptroller General
of the United States

Washington, D.C. 20548

Decision

Matter of: Hewlett-Packard Company

File: B-239800

Date: September 28, 1990

Rand L. Allen, Esq., Wiley, Rein & Fielding, for the protester.
David C. Rickard, Esq., Defense Nuclear Agency, for the agency.
Ralph O. White, Esq., and Christine S. Melody, Esq., Office of the General Counsel, GAO, participated in the preparation of the decision.

DIGEST

1. Protest that requirement for 128 kilobytes (128K) of memory for transient digitizers unduly restricts competition is sustained where the record fails to show that the specification is reasonably related to contracting agency's current needs, since the 128K memory capacity cannot be utilized by the agency given current technology and even if the necessary technology becomes available in the near future, the agency lacks any definite plans to use it.

2. Contention that requirement for a DR11 compatible high speed parallel port for transient digitizers improperly restricts competition is sustained where the contracting agency in effect concedes that compatibility feature is not required to meet its minimum needs.

DECISION

Hewlett-Packard Company (HP) protests any award under invitation for bids (IFB) No. DNA002-90-B-0032, issued by the Defense Nuclear Agency (DNA) for transient digitizers to convert electronic signals received from sensors used in underground nuclear test detonations to digital data, and to transmit such data to DNA computers. HP contends that two of the salient characteristics included in the specifications set forth in the RFP exceed DNA's minimum needs and unduly restrict competition.

We sustain the protest.

The IFB, issued on a brand name or equal basis, called for bidders to provide 100 Tektronix, Inc. Transient Digitizers, Model No. RTD 720, or equal. In addition, the IFB listed 24 salient characteristics of the Tektronix device in order to permit potential bidders and the government to evaluate whether other digitizers are equal to the Tektronix model specified.

After the IFB was issued, HP filed written inquiries with DNA, and eventually filed an agency protest, challenging several of the salient characteristics included in the IFB as overly restrictive. According to HP's initial inquiry, the list of salient characteristics appeared to be "a condensed version of the applicable Tektronix data sheet, rather than a clear and understandable statement of the government's needs for this procurement." Although DNA amended the IFB to address some of the questions raised, HP's agency protest was denied on May 15, 1990.

On May 23, 1 day prior to bid opening, HP protested to our Office. HP's protest asserts that two of the requirements included in the salient characteristics for an "equal" product--that each digitizer possess 128 kilobytes (128K) of waveform memory and that each digitizer be equipped with a DR11 compatible high speed parallel port--are unduly restrictive of competition and exceed DNA's minimum needs.

On May 24, DNA proceeded with bid opening. The agency received only 1 responsive bid--from the manufacturer of the specified brand name equipment. The other bid, from a different digitizer manufacturer, acknowledged, on its face, that it did not comply with the salient characteristics, and challenged the specifications as unduly restrictive.

BACKGROUND

The digitizers sought by DNA in this procurement are used in monitoring underground nuclear test detonations conducted in tunnels mined into mesas at a Nevada test site. At these underground sites, DNA constructs a test bed consisting of the source phenomena--i.e., the explosive device and the objects or materials subjected to the explosion or the effects thereof--and the sensors and gauges that convert measurements to electronic signals.

In configuring such test events, great distances are required between the instruments that measure the effects of a test and the computers that record and analyze the electronic signals generated by the measuring equipment. The electronic signals are initially transmitted from the sensors and gauges via coaxial cable; such signals, when

carried great distances via coaxial cable in an underground nuclear test environment, deteriorate rapidly. Thus, DNA feeds the signals into digitizers (also underground, and located as close to the gauges and sensors as possible) that convert the data to a digital format. In digital format, the signals generated by the sensors are less subject to degradation and interference as they are transported by fiber optic cable through the tunnel and out of the mesa to a recording station 7 miles away. At the recording station the digital signals are recorded on tape for analysis by computer.

The digitizers used by DNA are also required to "multiplex" signals from more than one sensor before transmitting the signals to the recording site. Multiplexing of signals by digitizers requires that the digitizer possess sufficient memory to delay (and remember) signals for a very short time until a group of signals are collected. After collecting a group of signals, the digitizer then transmits the group (in converted digital format) to the recording station. According to both parties, gathering, delaying, and transmitting eight signals from a single digitizer, with a microsecond of delay between each signal, requires 16K of memory.

128K MEMORY REQUIREMENT

Parties' Positions

In its challenge to the salient characteristics included in the IFB, HP focuses first on the requirement that each digitizer have 128K of waveform memory. According to HP, none of the needs cited to date by DNA, either in response to HP's initial inquiry or in response to HP's protest to the agency, supports a requirement for more than 16K of memory, as opposed to the 128K of memory established in the IFB.1/

1/ In its protest to the agency, HP asserted that DNA needed no more than 8K of memory in its digitizers. DNA's May 15 response to HP's agency protest enumerated three reasons why a digitizer with an 8K memory would not meet the agency's minimum needs. According to DNA, a digitizer with an 8K memory (1) would not be able to replace DNA's model 6880 digitizers; (2) would not be able to substitute for lower class digitizers; and (3) would not meet the intended multiplexed recording need. HP now abandons its earlier contention regarding 8K memory capacity, but argues that 16K of memory will meet each of these enumerated needs.

In support of its claim that it needs 128K of memory, DNA first explains, in general terms, that its requirements for recording test data far exceed its current capability. It notes that even with the addition of the digitizers that are the subject of this procurement, DNA will not be able to record all of the data generated. Also, DNA claims that the limitation on its ability to record data "[I]s directly related to the quantity of memory available to the digitizers . . . since additional memory per digitizer allows the recording of additional signals."

More specifically, DNA argues that it has a need for increased multiplexing of sensor and gauge signals into a single digitizer, and hence a need for larger memories in its digitizers.2/ In this regard, DNA explains that by using fiber optic delay lines the agency could multiplex as many signals as possible with a single digitizer. DNA also argues that HP overlooks the agency's ongoing need for greater resolution and better fidelity of the signals it transmits, asserting that both are significantly improved by sampling at a faster rate, requiring larger memories. Finally, at the hearing on the protest, DNA's technical witness for the first time asserted that DNA has a Strategic Defense Initiative (SDI) requirement to record the effect of nuclear radiation on a mirror and to measure the mirror's recovery period. DNA's witness explained that recording this experiment could require sampling for 70 microseconds;3/ he further explained that sampling at a rate of 1-2 gigasamples (1-2 billion samples) per second, for 70 microseconds, would require 70K-140K of memory to record the associated signals.

With respect to the need for increased multiplexing, HP counters that current technology bars multiplexing the quantity of signals needed to utilize 128K of memory. Specifically, HP claims, and DNA agrees, that using current measuring procedures and technology, the 8:1 multiplexing described above--i.e., transmitting eight signals from a single digitizer with a microsecond of delay between each

---

2/ In its response to the protest, DNA initially reiterated the three requirements stated in its response to HP's agency protest, one of which was the need for increased multiplexing. The agency has since conceded that the other two requirements--replacing the model 6880 digitizers, and substituting for lower class digitizers--can be met by a digitizer with 16k of memory.

3/ A microsecond equals 1 millionth of a second.

signal--is the maximum number of signals that can be multiplexed with a single digitizer.

DNA counters that recent and developing advances in technology should permit increased multiplexing capability. In particular, DNA points to research with fiber optic delay lines performed at Sandia National Laboratories indicating that significant signal delays--allowing for greater numbers of signals to be multiplexed to a single digitizer--are achievable with fiber optic technology. In addition, DNA claims that on or about June 13, during the pendency of this protest, it successfully conducted a feasibility demonstration of an analog fiber optic delay line that could be used between the sensors and the digitizers. As a result of its demonstration, DNA asserts that achieving sufficient signal delay to utilize 128K of memory in a digitizer is feasible, although the agency offers no objective evidence of any intent to use fiber optic delay lines in this capacity in the near future.

In rebuttal to DNA's claims of possible technological advancements that would permit multiplexing at the level needed to utilize 128K of waveform memory--i.e., 64:1 multiplexing--HP argues that DNA has no serious or concrete plans to realize a 64:1 multiplexing capability, and has not shown that a multiplexing capability greater than 8:1 is reasonably achievable in the near term. Further, HP argues that even if DNA could achieve 64:1 multiplexing, the possibility that failure of one digitizer or signal could result in a loss of 64 channels of data is inconsistent with DNA's stated goal of minimizing risk of data loss.

HP also challenges DNA's claims regarding resolution and fidelity, and the need to observe the effects of radiation on a mirror for the SDI program. Addressing resolution and fidelity, HP argues that paragraph 9 of the salient characteristics in the IFB sets forth the requirements for sampling resolution, and that if DNA needed greater resolution or fidelity, then the specifications should have so stated. With respect to the SDI requirement, HP notes that despite the extensive record developed in this protest, there is no mention of SDI, or of any tests to be performed in support of SDI. In addition, HP argues that the measurements from such a test could easily be handled by a digitizer with 16K of memory because the deformation and recovery of a mirror is a physical phenomenon requiring

sample speeds exponentially smaller than 2 gigasamples per second.4/

Analysis

When a protester challenges a salient characteristic included in a brand name or equal solicitation as unduly restrictive of competition, we will review the record to determine whether the restrictions imposed are reasonably related to the contracting agency's minimum needs. Data-Team, Inc., 68 Comp. Gen. 368 (1989), 89-1 CPD ¶ 355. We find that the record in this case shows that the requirement for 128K of memory is not reasonably related to DNA's minimum needs since the 128K memory capacity cannot be utilized by DNA given current technology, and even if the necessary technology becomes available in the near future, DNA has no definite plans to use it.

As a preliminary matter, HP claims that the salient characteristics in the IFB appeared to have been taken from the applicable Tektronix data sheet; internal agency documents provided in response to this protest substantiate HP's allegation. Nonetheless, the fact that specifications are based upon a particular product is not improper in and of itself; nor will an assertion that a specification was "written around" design features of a particular product provide a valid basis for protest if the record establishes that the specification is reasonably related to the agency's minimum needs. Infection Control and Prevention Analysts, Inc., B-238964, July 3, 1990, 90-2 CPD ¶ 7.

In evaluating HP's challenge and DNA's attempt to establish its minimum needs for digitizer memory, we first reviewed the stated purpose and intended use of digitizers in the test environment. During the hearing on the protest, DNA's technical witness explained that the only purpose for a digitizer is to convert electronic signals to digital data for fiber optic transmission. Thus, the memory requirements for digitizers are established by the capacity necessary to gather, delay, and transmit signals, not to store signals for later retrieval--i.e., a digitizer is not an underground

---

4/ During the hearing, HP's technical witness suggested that there would be no need to sample measurements of mirror degradation and recovery at the 2 gigasamples per second rate established as the maximum sample speed for these digitizers. HP suggested that a more appropriate sample speed would be many thousand times slower. DNA's technical witness did not disagree with this assessment when given the opportunity to do so.

computer for storing signals.5/ DNA's technical witness also explained the barriers to multiplexing signals beyond the current 8:1 level: a need for long delay lines between sensors and digitizers, and a need for larger digitizer memories to gather, delay, and transmit signals.

Although the agency, to date, is only capable of 8:1 multiplexing, DNA claims that the requirement for 128K of memory is justified by its potential ability to develop long delay lines by taking advantage of recent technological developments in fiber optic transmission. Prior to the hearing, DNA had only offered evidence of success at Sandia National Laboratories in achieving 20 microseconds of delay with fiber optic delay lines--a delay of 64 microseconds would appear to be necessary to utilize 128K of memory. During the hearing, DNA's technical witness explained that the agency had conducted its own "feasibility determination" of the use of such lines, concluding that a delay of 66 microseconds is feasible. HP responds that the agency has fallen far short of showing that the use of such long delay lines is possible in the near future.

Although we agree with HP's concerns regarding whether DNA will actually realize the technological advances necessary to utilize such delay lines, even if we assume that DNA will be able to make such progress, the extensive record developed in this case includes no documentary evidence of any intended or planned signal multiplexing at a level of 64:1. In fact, when asked if the agency based its claimed need of 128K of memory on a 64:1 multiplexing capability, the agency witness replied that he did not intend to build a 64:1 multiplexer unless or until an event or experiment required such a multiplexer. Nor did he identify an event or experiment that might require such a capability. Also, the agency made no other showing of how 128K of memory might be related to increased multiplexing needs.

Since DNA has not articulated any tangible need for the memory, and the effect here is to significantly limit competition, we find that the record does not adequately

---

5/ DNA's witness did state, however, that in the event of a communications failure that interrupts transmission of the digital signals to the recording station, larger memories in digitizers could permit manual retrieval of more information than might otherwise be obtained. Such retrieval could only be made after radiation levels in the tunnel dropped sufficiently to permit manual access to the digitizer.

justify the requirement.6/ In reaching our conclusion here, we are not barring agencies from determining that their minimum needs include the ability to take advantage of developing technology. Cf. Government Sys. Integration Corp., B-227065, Aug. 7, 1987, 87-2 CPD ¶ 137 (agency reasonably specified salient characteristic for equal ADP equipment that included additional capacity for increased future needs). Rather, we find that in this case, DNA has not sufficiently articulated any concrete need--current or future--for the memory requirement.

We also find no relation between DNA's claimed need for greater resolution and better fidelity of signal recording and the requirement for 128K of memory. The requirement for improved recording capability does not arbitrarily translate to 128K, as opposed to 100K or 200K, of digitizer memory. The record here offers no reason why 128K is preferable to any other increase in memory capability. In addition, as HP claims, the specifications already establish requirements for resolution and for sample speed. If DNA needs higher capabilities in this area, then the increased need should be reflected in those specifications.

With respect to the requirement for recording measurements of deformation and recovery of a mirror subjected to nuclear radiation, we again find DNA has not shown that such an exercise requires 128K of digitizer memory. Initially, we note that DNA made no mention of this requirement until the hearing on this protest.7/ In response, HP challenged the assumption that measuring such changes to a mirror would require high sample speeds. HP's technical witness suggested that much slower sample speeds would adequately record physical phenomena such as this and countered that, at the appropriate sampling speed, a digitizer with 16K of memory would meet the agency's requirement. Not only did

---

6/ As noted above, agency documents support HP's contention that the salient characteristics in the solicitation were largely copied from the applicable Tektronix data sheet. While such reliance is not per se improper, when combined with a record that does not establish any independently articulated need for the memory, it suggests that the agency failed to adequately examine its minimum needs.

7/ The agency failed to mention this need in the agency report, the contracting officer's statement, or in any of the documents appended to the agency report in support of the solicitation requirements. Further, the agency has not provided any documentary support for this claimed need since the hearing.

DNA's technical witness fail to disagree with this assessment when asked, but the agency made no attempt to rebut the assertion or provide documentary evidence in support of the existence of the need in its post-conference comments. Under these circumstances, we have no basis to conclude that DNA's SDI requirement justifies the restriction that only digitizers with 128K of memory will meet the agency's needs.

In conclusion, we find that the record fails to show any reasonable relationship between the agency's minimum needs and the requirement that any digitizer offered as an equal to the Tektronix model possess 128K of waveform memory. First, of the three reasons originally given by DNA in support of its requirement, the agency now concedes that two of the reasons claimed do not support the requirement for 128K of memory; only the assertion that the need for increased multiplexing of signals to a single digitizer remains. Second, DNA has not established that its general need to record more information than it has the capability to record is reasonably related to a specific requirement for any particular memory capacity. Finally, we find that DNA has not established a reasonable relationship between its needs for fidelity and resolution, or its SDI requirements, and the claimed need for 128K of digitizer memory.

DR11 COMPATIBLE HIGH SPEED PARALLEL PORT REQUIREMENT

HP also challenges the solicitation requirement for a DR11 compatible high speed parallel port. Paragraph 20 of the salient characteristics in the IFB, entitled "Interfaces," requires two electronic interfaces: a GPIB, IEEE-488 port for instrument control and waveform data output; and a high speed parallel port, "DR11 compatible for waveform data output only." Although DR11 compatible ports are used throughout industry, HP claims that only Tektronix manufactures such ports for this class of digitizers. The salient characteristics also require that all products offered as equal to the Tektronix model must be production units, and that prototypes are not acceptable.

DNA responds that it has a valid requirement for a separate output-only port because ports that can both input and output data--like the IEEE-488 port on HP's digitizers--can malfunction in an underground nuclear test environment. The agency explains that, in the past, ports that both input and output data have interpreted test bed noise as a command and have caused the machine to lose data. Thus, DNA explains that between its dry run test and the actual test event, the digitizer must be converted to strictly one-way--output only--operation, and must become autonomous.

In our view, HP's challenge to the solicitation's port requirement is, in essence, a challenge to the requirement for DR11 compatibility, not the requirement for an output-only port. HP stated in the hearing that its IEEE-488 port is capable of serving as an output-only port.8/ DNA responds, in its post-hearing comments, that given this capability, it appears likely that HP's port will meet the agency's minimum need for an output-only port.

We are persuaded that DNA must assure that ports not be subject to interference that might cause loss of data during the test event, and that an output-only port is required. However, the need for an output-only port does not translate into a requirement for DR11 compatibility as well. While the specification requires DR11 compatibility, and in addition requires an output-only port, from our review of the record it is clear that DNA's requirement is solely for an output-only port. DR11 compatibility is simply a characteristic required to achieve an output-only capability with the Tektronic brand-name equipment. This feature is in no way related to the agency's general minimum need for an output-only port.

Given DNA's admission that an IEEE-488 port--which is not DR11 compatible--may adequately address the agency's requirement for an output-only port, we find that the requirement for a DR11 interface exceeds the agency's minimum needs. Thus, we sustain HP's challenge to the specification with respect to the requirement for a DR11 interface.

RECOMMENDATION

By letter of today to the Director of the Defense Nuclear Agency, we are recommending that DNA cancel the IFB, amend the specifications in the IFB in accordance with this decision to accurately reflect the agency's minimum needs and reissue the IFB with the revised specifications. In addition, we find that HP is entitled to the costs of filing and pursuing its protest, including attorneys' fees. Data-Team, Inc., 68 Comp. Gen. 368, supra. HP should submit its

---

8/ HP's technical witness explained that "there are switches on our boxes where it could only be output, and if that's what their desire is, we can do that."

claim for such costs directly to the agency. 4 C.F.R. § 21.6(e) (1990).

The protest is sustained.

for Comptroller General
of the United States