ARMED SERVICES BOARD OF CONTRACT APPEALS

Appeal of --	)	
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Ensign-Bickford Aerospace & Defense Company	)	ASBCA No. 57929
	)	
Under Contract Nos. N00164-07-D-4259 N00164-08-D-JM15	)	

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OPINION BY ADMINISTRATIVE JUDGE PAGE

This appeal arises from Contract Nos. N00164-07-D-4259 (Contract No. 4259) and N00164-08-D-JM15 (Contract No. JM15) (collectively "the contracts"), which called for Ensign-Bickford Aerospace & Defense Company[1] (EBA&D, appellant or the contractor) to provide the Department of the Navy, Naval Surface Warfare Center, Crane Division (NSWC, Navy, or government), with MK 154 Delay Detonators (detonators) (R4, tabs 15, 35). EBA&D's 12 July 2011 certified claim totaling $911,293.13 contested the government's disapproval of Lot Acceptance Test (LAT) Reports for detonator lots 11-14 (R4, tab 95). After a four-day hearing at the Board's offices, the parties filed a compact disc containing six video files (R4, tab 175), and post-hearing briefs. We decide entitlement only, and sustain the appeal.

[1] The original contracts were issued to Shock Tube Systems, Inc. (R4, tabs 15, 35). On 9 September 2009, the parties entered into novation agreements transferring the interests of that company to EBA&D (R4, tabs 51, 52).

FINDINGS OF FACT

1. Before the development of shock tube,[2] electric blasting caps were the state-of-the-art. The electric caps were sensitive to stray electrical energy or radio frequency energy and often resulted in accidental initiations. (Tr. 2/16-17) A shock tube is immune to radio frequency energy, static electricity, and stray electrical energy and therefore, safer as well as much easier to use in the field environment. Shock tube has almost totally replaced electric blasting, both for commercial and military use. (Tr. 2/17-18) EBA&D developed this product and provided it to the government, after which the government created the Technical Data Package (TDP) around it (tr. 2/41).

2. The MK 154 detonator has two initiators attached to 100 feet of dual shock tube, which is two strands of tubing connected by a web to keep them together, with two blasting caps crimped onto the end (tr. 2/22, 3/114). The shock tube is hollow on the inside, and is dusted with a tiny amount of explosive powder (tr. 2/21). In use, a firing device sets off the percussion primer which sends heat and flame into the shock tube, causing the explosive powder that lines the interior wall of the shock tube to ignite. This creates a dust explosion that propagates down the shock tube setting off whatever output charge is at the end. (Tr. 2/21-23) The contract states the MK 154 "is used to initiate demolition charges and/or other explosive charges from a safe distance and appropriate shelter using a hand held firing device" (R4, tab 7 at 108, tab 48 at 1218). Explosive ordnance disposal personnel use it to blow up improvised explosive devices and suspect items, and to destroy unserviceable ammunition assets under controlled conditions (tr. 3/116, 4/101).

Contract Requirements

3. The contracts are comprised of two general sections; there is the section containing the administrative requirements, and the section containing the technical requirements. The latter are contained in the TDP (tr. 1/39, 189-90). The TDP in the instant contracts[3] consisted of government drawings, the Ordnance Engineering Specifications (OES), the quality assurance requirements, and the Automated Data List (ADL) (R4, tabs 7, 48; tr. 1/108). The Supplemental Quality Assurance Provisions (SQAP) are also part of the TDP, and serve as a guide for classification of characteristics and inspections (R4, tab 2; tr. 1/104-07).

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[2] The term "shock tube" as used in the industry is interchangeable with "shock tubes."

[3] Both contracts had the same technical requirements. Because the testimony and briefs often reference a single contract, we use the corresponding reference but note that the technical specifications are common to both.

4. As part of the TDP, the contract required EBA&D to produce a first article (FA) for government approval which states:

> FIRST ARTICLE (CONTRACTOR TESTING)
> (NAVSEA) (SEP 1990):
>
> (a) For the purpose of this contract, the "First Article" is synonymous with terms "preproduction model(s)" and "preproduction equipment."
> (b) The First Article shall conform in every respect to the requirements of this contract and shall be fully tested by the Contractor at its own expense to determine compliance with said requirements. The production equipment shall be manufactured with tools, material and methods which are the same as or representative of the tools, material and methods which were used to manufacture the First Article.

(R4, tab 15 at 299, tab 35 at 1082)[4]

5. Contract No. 4259 also included the following:

> CLIN-I-0006 NOTICE: FIRST ARTICLE AS MANUFACTURING STANDARD
>
> Each first article approved under this contract shall serve as a manufacturing standard for the corresponding production items delivered hereunder.

(R4, tab 15 at 327)

6. The TDP provides, among other things, the product test and acceptance requirements (R4, tab 7 at 99-107, tab 48 at 1209-17). Regarding the first article, the specifications state:

> 3.3 First Article Sample. Unless otherwise specified in the contract or order (see 6.2), a First Article sample of 100 dual in-line detonators shall be furnished by the contractor. The dual in line detonators, their components and all materials shall be of a single type, grade, class size and

[4] Several documents in the Rule 4 file contain more than one page number. We are using the full number found at the middle of the bottom of the page. As appropriate, we eliminate the preliminary alphanumerical reference "GOV000."

> composition and shall comply with all of the applicable provisions of the contract documents and this specification. The First Article sample shall be manufactured using the proposed full production methods.

(R4, tab 7 at 97, tab 48 at 1207-08)

7. The specifications mandate that once the first article is approved, the manufacturing process in all following production shall be the same as that for the approved first article:

> 3.4.5 Configuration Control. The baseline configuration shall be frozen with the Government acceptance of the First Article or First Production Lot sample submission. The contractor shall implement configuration control in accordance with EIA649. Any deviation from the baseline configuration will require Technical Activity concurrence and Procurement Contracting Officer approval.

(R4, tab 7 at 98, tab 48 at 1209)

8. EIA-649-A is a Government Electronics and Information Technology Association (GEIA) publication entitled, "National Consensus Standard for Configuration Management" (R4, tab 108). This publication describes the general standards for configuration management established by ANSI (American National Standards Institute) (*id.* at 1814; tr. 1/103-04). At all times pertinent to this appeal, the edition in use was EIA-649-A.

9. Configuration management is the process by which a company controls movement from one drawing to another and any changes in those drawings. This allows the producer/manufacturer to know which revisions are being produced and what the requirements of those revisions are. It is a way to control change and to ensure that if there are two facilities producing a part, both will produce a part that meets requirements. (Tr. 1/95-97) While "configuration control" is not defined in EIA-649-A, the following, of particular relevance to this appeal, are defined:

> **configuration**: (1) The **product attributes** of an existing or planned **product**, or a combination of **products**; (2) one of a series of sequentially-created variations of a **product**.
>
> ....

configuration baseline: Agreed-to information that identifies and establishes the **attributes** of a **product** at a point in time and that serves as basis for defining change.

configuration change: An alteration to a **product** and/or its **product configuration information** (as documented in a request for change).

configuration change management: The CM **function** that ensures changes to a **configuration baseline** are properly identified, recorded, evaluated, approved or disapproved, and incorporated and verified as appropriate.

....

product attribute(s): **Performance, functional,** and **physical characteristic(s)** of a **product**.

(R4, tab 108 at 1828-30)

10. EIA-649-A includes a section describing Configuration Change Management and a table entitled, "Typical Major Change Criteria" (R4, tab 108 at 1844-48). The table provides three measures for identifying such change. It may be one "that affects specified and approved requirements for product attributes, including safety, reliability, and supportability." Or a major change could be one which:

> [A]fter establishment of the baseline for the product design or implementation of the product design, that affects compatibility with interfacing products, including such products as test equipment, support equipment and associated software, and products furnished by a customer or that affects one or more of the following:
>
> - delivered operation or servicing instructions;
> - required calibration to the extent that product identification should be changed;
> - interchangeability or substitutability of replaceable products, assemblies, or components;
> - change to add a previously non-qualified supplier, where supplier selection is specified;

- user skills or user physical attributes;
- operator or maintenance training; and
- requires retrofit of delivered products; e.g., by product recall, modification kit installation, attrition, replacement during maintenance using modified spares.

(R4, tab 108 at 1848)

11. EBA&D has a configuration control board where proposed design changes to a manufacturing configuration are presented for consideration. The EBA&D configuration control board consists of senior managers, including representatives from quality, manufacturing, and design, and is a formal process. (Tr. 1/100-01) EBA&D's configuration management program is ISO 9000[5] certified, meaning the program meets the highest level of certification in regard to its quality program, its manufacturing program, and its documentation program (tr. 1/102-04).

12. The TDP's OES contains the detailed specifications regarding the shock tube's performance and product characteristics, and the testing required for acceptance. Performance characteristics are extensively detailed in paragraph 3.5 regarding the assembly strength, pull strength, static function, withstanding water pressure, transportation vibration, temperature and humidity fluctuations, as well as withstanding a 12-meter drop and a certain kilovolt of electrostatic discharge. (R4, tab 7 at 99-100, tab 48 at 1209-11)

13. Two types of inspections are described in the TDP: one is the First Article Sampling Plan and the other is the Quality Conformance Inspection. The First Article Inspection description at paragraph 4.3, includes the caveat, "Any production of the item prior to authorization by the procuring agency shall be at the risk of the contractor." (R4, tab 7 at 101, tab 48 at 1212)

14. The Quality Conformance Inspection is divided into categories titled Plan A and Plan B. Quality Conformance Inspection is defined at paragraph 4.4 as follows:

> 4.4 Quality Conformance Inspection. An inspection lot shall consist of 1201 to 10000 dual in line detonators offered for delivery at one time including test samples (see

[5] ISO 9000 refers to standards for quality management of the International Organization for Standardization.

6.2). Inspection lots shall be inspected as follows:

a. Any change in materials, suppliers or production methods shall be considered an interruption for the beginning of a new inspection lot. Record the reason for the interruption on the Ammunition Data Card (see 6.2).

b. Each lot shall be sampled in accordance with Table II, Plan A.

c. Sampling, examination, testing and acceptance of inspection lots shall be performed as specified in the steps given below:

Step 1. Upon starting production, delivery of an acceptable First Article or rejection of a lot for test requirements, as applicable, all inspection lots shall be examined, tested in sequence and accepted in conformance with Table II, Plan A until two consecutive lots have met the requirements and have been accepted by the Government.

Step 2. Inspection lots other than those specified in Step 1 shall be examined, tested in sequence and accepted in conformance with Table II, Plan B, except that one lot shall be randomly selected from each five consecutive inspection lots and examined, tested in sequence and accepted in conformance with Table II, Plan A.

(R4, tab 7 at 101-02, tab 48 at 1212-13)

15. Plan A is basically the same testing required for the first article samples but without the requirement for a 12-meter drop and does not include as many units. However, all other tests are the same in Plan A, including subjecting the units to temperature and humidity (T&H) testing (environmental testing) and transportation/vibration testing. In Plan B, the units do not go through T&H or vibration testing. (R4, tab 7 at 107, tab 48 at 1217; tr. 1/50, 3/141-42)

16. The T&H testing is a severe test which takes the unit through extreme temperatures from 165 degrees Fahrenheit to minus 65 degrees over a period of 14 days. It stresses the shock tube and significantly, provides an approximation of how extreme temperatures will fatigue a unit. (Tr. 3/127-28, 153) According to Barbara Robinson, the contracting officer's technical representative (COTR)

(tr. 1/44-45), the government uses the T&H results to gauge how a unit will function in the extreme heat of an environment like Iraq, or cold such as that found in the mountains of Afghanistan. She testified that the government also uses the results to gauge how the units will hold up after being stored for ten or more years, as presently the government has no magazines in theatre and detonators are stored in the field with the warfighter. (Tr. 3/127-28)

17. Mr. Douglas McMann, a project engineer at EBA&D, reduced Table II, found in the specifications (R4, tab 7 at 107, tab 48 at 1217), to a flow chart for ease of use, and at the hearing, described the testing (R4, tab 171; tr. 1/87, 120-28). He testified that every fifth lot has to be a Plan A and the government can call at any time for a Plan A. In a Plan A series, 60 units are randomly selected from the lot being tested. After selection, the 60 units are radiographically inspected and then all 60 are electrostatic discharge tested. (Tr. 1/125) Following these tests, the 60 units are broken into four groups. Ten go through in-line and detonator assembly testing, called pull testing. Twenty units go through transportation vibration testing, followed by radiographic inspection to insure nothing has shaken loose, then the units are water pressure tested, where they are submerged in water for a prescribed period of time at a prescribed pressure. Twenty go through the T&H testing where the units are subjected to a 14-day cycle of increased and decreased temperatures and humidity. Then these 20 are water pressure tested. The last group, a group of ten, are just water pressure tested. (Tr. 1/126) After this, the units from the four groups are subdivided further and put through different stresses of hot, cold, and ambient temperatures, and then functioned (tr. 1/127). These last stresses for the subdivided groups, as defined in the OES chart (R4, tab 7 at 107, tab 48 at 1217), are graphically represented in Mr. McMann's chart. One subgroup is conditioned in a hot soak (four hours minimum at temperatures of 160 +/- 4 degrees F, after which the sample must be function tested within five minutes after removal from the chamber), one subgroup in a cold soak (four hours minimum at temperatures of -65 +/- 4 degrees F, after which the sample must be function tested within five minutes after removal from the chamber), and the third subgroup at ambient temperature (73 +/- 18 degrees F). (R4, tab 171) "Functioned" means detonated.[6]

18. Plan B, as described by Mr. McMann, consists of selecting 60 units from the lot, examining all 60 for workmanship, inspecting them radiographically, and subjecting all to the electrostatic discharge test. At this point, ten units go through the pull test, and the remaining 50 go through a water pressure test. The ten are next broken into smaller groups of three, three, and four, and subjected to the hot, cold, and ambient temperature soaks. The 50 are broken into smaller groups of 15, 15, and 20 and subjected to the hot, cold, and ambient soak testing. Then all 60 are detonated. (R4, tab 171 at second page; tr. 1/127-28)

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[6] *See, e.g.*, testimony regarding testing (i.e., including "functional" or "detonated" shock tube at tr. 1/201-02.

19. Under normal conditions, EBA&D would do a Plan A, four Plan B's, Plan A, four Plan B's, etc., but the government could call for a Plan A at any time. Plan A is more exhaustive and more expensive and puts higher environmental and physical stresses on the product as compared to Plan B. If there are failures or a noncompliance, these would more likely show up under a Plan A than a Plan B. (Tr. 1/127-29)

EBA&D's Manufacture of the MK 154

20. The MK 154 has 100 feet of dual shock tube with an input end and an output end. On the output end, there are two blasting caps crimped onto the end. The input end has an inline initiator, a metal body with rubber bushing for crimping the initiator onto the shock tube. It has an electrostatic shunt, which provides electrostatic protection, and a primer which is used to initiate the shock tube. (Tr. 2/22)

21. The tubing itself is made up of two single strands of shock tube held together with a connecting web (tr. 2/29). Shock tube is produced when plastic pellets, about 1/8th inch in diameter, are fed into a machine known as an extruder (tr. 2/25-26). An extruder is typically about 6 or 8 feet long, with a 2-inch diameter rotating barrel. The heat and friction of the rotating plastic, along with heater bands alongside the extruder, melt and compress the plastic, pressing it through a die to form the profile of the shock tube, as it is expelled from the machine. The MK 154 has three layers of plastic: the inner layer, made up of DuPont surlyn with characteristics which allow explosive powder to adhere to it; the outer layer made up of a medium-density polyethylene which is a nylon providing environmental protection; and a middle layer, called the tie-layer, which holds the two other layers together, and makes them work in unison. (Tr. 2/26-27)

22. The first extruder expels the surlyn. There is a tightly controlled powder feed system which sprinkles explosive powder on the tubing as it is being extruded. EBA&D has a specially designed system that feeds the powder at a predetermined rate. It is very important that the powder be applied evenly. The tubing then goes down a vertical cooling tower, approximately 10 feet tall, and is sprayed with cold water. After this, it goes through a quench tank, with multiple passes on pulleys. (Tr. 2/27) The tubing exits the quench tank and goes into another crosshead for two extruders. One extruder forces out the outer jacket, melting and applying the outer jacket of polyethylene, and a smaller extruder discharges the tie-layer, a small bead of ethylene-vinyl acetate which bonds the two single tubes together. (Tr. 2/28-29) Then, the three-layered molten tube goes into another quench tank, about 15 feet long, in order to cool. After cooling, the shock tube goes onto pulleys which wind it on large process spools. (Tr. 2/28)

23. The extrusion rate, or run rate, refers to the rate at which the shock tube is expelled from the extruders (R4, tab 64 at 1340; tr. 2/32, 3/132-33). The extrusion rate affects the shock tube's tensile strength, defined as "like when you take a rubber band, and you pull it...[a]nd then you could only pull it so far and then it breaks" (tr. 3/133). The extrusion rate also affects the "shrinkback," which is a percentage measurement comparing the original length to the length after testing. A four percent shrinkback is acceptable and anything higher is not. (Tr. 2/130, 3/134-37)

Venting

24. Venting of the shock tube is a phenomenon that occurs after detonation or "function" of the MK 154 (tr. 1/207).

25. COTR Robinson testified that if there is some kind of weakness or flaw in the shock tube, it will either vent, rupture, or split. At the hearing, she described the differences by using two samples and photographs. (R4, tabs 139, 170; tr. 3/117-25) She described a vent as a small hole in the tube without much exhaust, as pictured in the photograph in the Rule 4, tab 139 at 5151 (tr. 3/118-19, 123). She described a rupture as a breach of the shock tube which opens up and after expelling gases, closes back down on itself. She said it looks like a scratch on the shock tube and is pictured in the photographs in the Rule 4, tab 139 at 5161-62. (R4, tab 170; tr. 3/118, 121-24) COTR Robinson characterized a split as the most violent reaction in which the shock tube almost splits in half, as pictured in the photographs at Rule 4, tab 139 at 5149-51 (R4, tab 170; tr. 3/118, 123-24).

26. COTR Robinson testified that a single vent in a sample lot would not necessarily make the lot unacceptable. "We have accepted lots with vents. The amount of vents and the location of the vents can play a role." (Tr. 3/124)

27. Mr. Brendan Walsh, EBA&D's president (tr. 1/29), described venting as occurring when gases from the explosive reaction cause "the jacket of the shock tube [to] rupture[] and the by-products of the explosive metal powder on the inside releases. So you get a small amount of gas and sound from the actual breaking of the tube." (Tr. 1/37) He testified venting occurs on a frequent basis (*id.*). At the time of the hearing, Mr. Walsh, an aeronautic-aerospace engineer, had been with EBA&D for over 20 years and its president for the preceding 3 years (tr. 1/29-30).

28. EBA&D's MK 154 program manager, Stephen Bartholomew, a chemical engineer, testified about the physics behind venting. Mr. Bartholomew has a "long familiarity" with shock tube and its manufacture since the beginning of its use in the United States in the 1980s. He testified that venting is common and has been associated with shock tube since "day one" (tr. 2/23). After his initial employment with EBA&D, in 1996 he helped create Shock Tube Systems, the predecessor

company on the contracts at issue. (Tr. 2/12, 17-24) According to Mr. Bartholomew, the reaction phenomenon goes down the shock tube at 6000 feet a minute, shaking the explosive powder off the wall of the tube, creating a miniature dust explosion with extremely high, but short lived, pressure levels. The by-products of the chemical reaction cause gases to increase to a higher pressure inside the tube, and "those gases have to go somewhere." The gases either vent out the input or the output end or pop a little hole and vent out the side somewhere. The gases are trying to find the path of least resistance. This takes place after the shock tube has detonated. (Tr. 2/24) Venting can also result in a "flameout," defined by Mr. Bartholomew, as "a phenomenon where the combustion gases that are venting from the shock tube ignite and you have a little puff of flame" (tr. 2/123). He testified his understanding was that this would occur if two vents occurred next to each other and the gas venting from one would be ignited by the gas emanating from the other (tr. 2/124). He testified he is not aware of nor could he contemplate any safety issues due to venting (tr. 2/170).

The First Article Test

29. The first article test (FAT) and Inspection Report for the MK 154 detonators was prepared 30 November 2007 (R4, tab 19). The report indicated the 100 units comprising the first article sample were tested in accordance with the contract requirements using the proposed full production methods, and that "[a]ll units met the requirements specified" (*id.* at 352). The first article samples were manufactured at an extrusion rate of 375 feet per minute (fpm) (tr. 3/133).

30. For the FAT, the contractor performed the T&H test on 30 samples after they had been subjected to a 14-day temperature and humidity cycle (R4, tab 19 at 353). There is no indication in the test data sheets that any of the T&H samples tested for the FAT vented, ruptured, or split (*id.* at 436-38). In the "Remarks" column of the test data sheets, only one unit carries a notation. "Cord shot" is written next to Unit 67. (R4, tab 19 at 438)

31. COTR Robinson was present at the FAT, and testified that if there had been a vent or a rupture or a split, she would have had it documented on the test data sheets (tr. 3/130). Mr. Mark DiFranco, the Defense Contract Management Agency (DCMA) quality assurance representative (QAR), also testified that the FAT exhibited no venting. He stated that if any of the T&H samples had vented, split, or ruptured, notations to that effect would have been made in the remarks section of the test data sheets. (Tr. 4/70-71, 77) However, Mr. Bartholomew testified he was present at the FAT because he was in charge of the product and he believes there was venting. He testified no notations were made in the remarks column of the test data sheets because "[i]t's not something we normally do." (Tr. 2/57) He said at some point, COTR Robinson started requesting that the notation of venting be made, but none of EBA&D's other customers have ever asked that it be done (tr. 2/57-59). By letter

dated 7 December 2007, the Navy informed the contractor the FAT was successful and had been accepted (R4, tab 20).

32. It is unclear from the FAT report whether the FAT samples vented or not. However, during production of the lots following acceptance of the FA, the data indicates venting occurred in lots 1 and 2, as well as in several follow-on lots (R4, tab 78 at 1529).

Primer Ejection Problem and Request for Deviation

33. During one of its LATs, EBA&D encountered a problem when a primer became deformed upon initiation. The top of the brass primer split open and the primer's anvil remained in place. The shock tube used on the unit initiated normally, but EBA&D submitted a deviation request because a drawing note, part of the TDP, required that the primer be secured sufficiently to prevent movement during function. The drawing note required that the in-line initiator coming up from the primer should not fragment, break, or disassemble during function. (R4, tab 105; tr. 1/116-18, 2/91-92) A contract modification was issued approving the request and decreasing the contract amount due EBA&D (R4, tab 106; tr. 1/119, 2/91-93).

Changing the Extrusion Rate

34. The MK 154 detonator FAT samples were manufactured with shock tube produced at an extrusion rate of 375 fpm (tr. 3/133). EBA&D wanted to increase the shock tube extrusion rate in order to meet increasing demand (R4, tab 64 at 1340; tr. 1/38-39).

35. In March 2009, Tom Nadeau, an EBA&D engineer and considered to be EBA&D's shock tube expert (tr. 1/131), performed initial testing and investigation on increasing the extrusion rate (R4, tab 109; tr. 2/36-37, 129). He sent Jeremy Stewart, the facility manager of the Sterling, Connecticut, plant where the product at issue was produced (tr. 1/31, 2/123), and Mr. Bartholomew, among others, an email containing the results of his testing on shock tube produced at an extrusion rate of 600 fpm (R4, tab 109; tr. 2/36-37, 129). He described the temperatures he used in the testing and stated that half the tube was deployed and then the unit detonated, "similar to what's done during LATs" (R4, tab 109). Mr. Nadeau noted that all units successfully performed but "[a]ll newly spooled units vented and/or flamed-out." He said the newly spooled units were not wound too well on the bottom. Three out of five "leftover" units vented and/or flamed out, he said, and two did not, even though "[a]ll of the 'leftover' units appeared to be spooled well." (R4, tab 109) The test data sheets from Mr. Nadeau's experiment show that every test sample experienced a "flame-out" (R4, tab 110 at 4908).

36. In the 2009 email, Mr. Nadeau concluded, "the use of 600 fpm tube in MK154s is risky based on the frequency of venting/flame-out and the physical deformation of tube on/near the spool barrel" (R4, tab 109). Mr. Bartholomew testified Mr. Nadeau was mistaken in stating that the 100 foot units are only unspooled about 50 feet in the LATs. He stated that in LATs the 100 foot units are completely unspooled. (Tr. 2/125-26) He also attributed the problems Mr. Nadeau encountered in his testing to the fact the samples were probably produced offline so as not to interrupt the production line, poor winding on the spool, and shrinkage of the shock tube on the spool (tr. 2/129). He testified about the importance of spooling and described the process, explaining it was especially important that the operators were trained to get the first layer on the spool properly because the subsequent layers go on top. If they are spooled improperly, it causes deformation of the bottom layer, and makes the tube weaker. (Tr. 2/38-40)

37. EBA&D continued to pursue increasing the extrusion rate (R4, tab 111). In 2010, Mr. Stewart approached COTR Robinson about changing the extrusion rate from 375 to 600 fpm (tr. 1/49, 3/131). He stated he did not did not want to perform another FAT and asked COTR Robinson what he should do. She testified that she told him he should follow the specifications. (Tr. 3/131-32, 139) She had several communications with Mr. Stewart and as COTR, she had no authority to deviate from the contract. Her email signature block clearly stated, "I am not a Contracting Officer, I cannot direct work or initiate or modify contracts; I do not have the authority to commit the Government financially in any way." (*See, e.g.,* R4, tabs 114, 117)

38. By email dated 21 September 2010, Mr. McMann, in furtherance of EBA&D's efforts to increase the extrusion rate, provided a summary of pre-production testing to his EBA&D teammates (R4, tab 112). This was done before the final production effort with 600 fpm to show that nothing in the moving up of the speed adversely affected the product (tr. 1/129-30). Along with the summary of test data, Mr. McMann stated: "Functioned the Temperature and Humidity units of the 600 fpm Shock Tube. Competed [sic] the data chart that Tristan had previously started. This should give us a high level of confidence going into the two MK154 Plan A testing series." (R4, tab 112 at 4913) When asked why two Plan A's would be performed, Mr. McMann said the two Plan A tests were required by the government because of the change from 375 fpm to 600 fpm. This requirement, he testified, came from COTR Robinson. (Tr. 1/130-31)

39. The test result tables attached to Mr. McMann's email contained a table with a column for "Rupture/Vents? (Yes/No)." All the results in the "Rupture/Vents" column said, "No." (R4, tab 112 at 4916) Mr. McMann described the terms as indicating any breach in the shock tube allowing the gas to escape. According to him, although the lack of venting or rupturing was not a requirement of the TDP, EBA&D made a point of noting whether the pre-production samples had vented or not

"[b]ecause we were making sure that we weren't making things worse." He explained that by this he meant EBA&D wanted to insure that changing the run rate would not result in something that would make the shock tube "not propagate." (Tr. 1/158) He testified that EBA&D was just checking its process on these preproduction units (tr. 1/158-59, 161-62).

40. By email dated 30 September 2010, Mr. McMann sent an email to COTR Robinson, with a "short description of the tests run and their results with respect to increasing the manufacturing speed of [the] Shock Tube" (R4, tab 64 at 1339). He testified he sent these to her because "[s]he knew that we were planning on running at 600 feet per minute and requested any information we had on our process prove outs" (tr. 1/134).

41. The information sent to COTR Robinson stated that, in order to accommodate the increase in the extrusion rate, "it was necessary to adjust the parameters of the Shock Tube manufacturing process in order to obtain the same cross-sectional dimensions." Once that was done, his email continued, EBA&D ran a series of tests in order to verify that product manufactured at 600 fpm met the applicable performance requirements and listed the tests. The report stated that, based upon the data attached to the report, "EBA&D has a high level of confidence that moving to the 600 fpm will present no performance issues." (R4, tab 64 at 1340) The raw data itself showed that there were no "ruptures/vents" for any of the T&H samples tested (*id.* at 1346).

42. According to LAT reports for lots 11 and 12, each of which was produced at 600 fpm, the lots were subjected to Plan A testing (R4, tab 67 at 1402-03, tab 66 at 1359-60). The test data sheets from the testing indicate 8 of 20 of the T&H samples from lot 11 vented and 8 of 20 of the T&H samples from lot 12 vented. All samples detonated or "functioned" as required. (R4, tab 67 at 1411-12, 1440-41, tab 66 at 1368-69, 1397-98)

43. According to COTR Robinson and QAR DiFranco, the noise from the breach in the shock tubes for lots 11 and 12 in the T&H testing was louder than anything previously experienced and the tubes themselves exhibited a high frequency of splitting and rupturing (tr. 3/146-48, 4/78-79). COTR Robinson testified she had not witnessed this high a number of vents and splitting in T&H units during all previous MK 154 production (tr. 3/148). She was concerned when this happened, she testified, because of the possible toxicity of the exhaust expelled from the shock tube and its flammability, and the effects these would have on the user. According to COTR Robinson, from her observations, if the user did not unroll the full 100 feet of the shock tube for a breaching operation, for example if only 10 feet were unrolled, she believed that the expulsion of the hot gas could ignite the remainder of the shock tube. (Tr. 3/124-25)

44. After observing the test, COTR Robinson informed EBA&D's Mr. McMann and Mr. Stewart that there were acceptance issues involving lots 11 and 12. At that point, Mr. Stewart informed COTR Robinson that EBA&D had already produced lot 13 and was halfway through lot 14. (Tr. 3/149-50) EBA&D produced lots 13 and 14 prior to knowing whether the Navy would accept lots 11 and 12 (R4, tabs 75, 76; tr. 1/73-74).

45. In an email dated 21 October 2010, EBA&D's Steve Lintner asked COTR Robinson whether she would agree to test lot 13 under a modified Plan A test while samples from lot 14 would only be subjected to a Plan B test. In an email dated 3 November 2010, she agreed to his suggestions and included Cynthia Dant, the contracting officer[7] in the email. COTR Robinson testified she had had a phone conversation with Mr. Lintner on 21 July 2016 and discussed what should happen with lots 13 and 14. Because the major issue was the T&H, she wanted to see if another Plan A T&H would experience the same results. In COTR Robinson's testimony, she said she was mainly interested in the T&H sample because T&H tests are the most severe, and stressed or fatigued the shock tube the most. (Tr. 3/152-53) In her 3 November 2010 email, she agreed to the testing Mr. Lintner proposed and explained to the CO that "[a]ll four lots in question have shock tube produced at 600 fpm versus the 375 fpm" (R4, tab 68).

46. At the end of November 2010, when the 20 T&H samples from lot 13 were tested, 11 of them split or vented in a manner similar to that observed in lots 11 and 12 (R4, tab 76 at 1506-07; tr. 3/154-55). The test data sheets contained remarks more detailed than that recorded previously, and COTR Robinson testified this was done so the test reports would more accurately reflect the nature of the breaches observed. No one from EBA&D disputed the more detailed notations, and EBA&D certified the test results and the remarks in the report for lot 13 as true and accurate. All units passed the enumerated tests and they all detonated as required by the contract. (R4, tab 76 at 1497-98, 1522-23; tr. 3/154-56)

47. Sample units from lot 14 were tested under the Plan B testing regimen, which does not include T&H testing (R4, tab 75 at 1472-73). The test data sheets indicate that two units exhibited splits and one appeared to vent (R4, tab 75 at 1481-82). COTR Robinson testified she was concerned because this had not been seen in previous lots produced at the 375 fpm extrusion rate. All the samples tested detonated as required by the contract. (R4, tab 75 at 1472-73, 1492-93; tr. 3/160-62)

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[7] The contracting officer, Ms. Dant is now known as Cynthia Martin. However, in this opinion, the Board refers to her as Ms. Dant for the sake of consistency, as that is the name which appears on the file correspondence.

48. As a result of her concerns, COTR Robinson contacted Chief Warrant Officer (CWO) Tyson Peters, the assistant program manager for linear charge and demolitions at the Marine Corps Base in Quantico, Virginia, NSWC's customer (R4, tab 114; tr. 3/163-64). She testified she was trying to ascertain if the Marines could use the units as training items, and she could recommend to the CO that the items be accepted with a deviation, or reduction in price. She believed they were unsafe to go to the warfighter in the field. (Tr. 3/164-65)

49. In her email to CWO Peters, COTR Robinson explained that EBA&D had increased their shock tube production rate from 375 fpm to 600 fpm and the test results of these lots showed splitting and venting to a greater degree than had been experienced in the testing of earlier units manufactured at 375 fpm. COTR Robinson admitted the Navy had accepted shock tube in the past which "had some venting (pin holes)...but nothing like this." She stated that "[i]f inventory requirements indicate these units are expended in the next few years, it seems unlikely that the splitting of tube will occur." (R4, tab 114 at 4924)

50. CWO Peters testified that after he read COTR Robinson's email, he forwarded it to the large caliber team engineer with the Marine Corps' System Command at Quantico, Mr. Richard Hardy, asking for his guidance with the technical issues she had raised (R4, tab 114 at 4924). He testified he did this in order to fully understand the issues identified by COTR Robinson (tr. 4/107).

51. Mr. Hardy responded with an email containing several questions including, "Is splitting or lack thereof a spec requirement?" He observed "perhaps our specs/TDP are loose enough where they can change the process but we don't know the ramifications on all properties of this material." (R4, tab 114 at 4923)

52. After this email was forwarded by CWO Peters to COTR Robinson, she responded stating that splitting of the shock tube is not expressly mentioned in the specifications and that "[t]his will be addressed." She explained the "units passed the T&H requirement and functioned." She said she was concerned the user may be exposed to fumes from the splitting if the venting is near the initiator. COTR Robinson wrote: "The sp[l]itting of the shock tube does not affect function and occurs after function due to the back pressure developed in the closed system." (R4, tab 114 at 4922)

53. Following this exchange, CWO Peters, Mr. Hardy, COTR Robinson, and CO Dant had a telephone conference (tr. 4/108). CWO Peters understood the lots were not acceptable because of the issues identified by COTR Robinson and the fact that these lots were performing in a way none of the previous lots had. CWO Peters testified this led him to lose confidence in the product. (R4, tab 114 at 4921; tr. 4/108-09) Mr. Hardy testified he counseled CWO Peters not to accept a deviation because of the anomalies exhibited in the lots at issue. There were concerns about possible fumes "and it was an

unknown to us." (Tr. 4/130) He explained that based on his experience in engineering, "in the realm of explosives we don't like to deal with unknowns" (*id.*).

54. COTR Robinson testified that she recommended that the CO not accept lots 11-14 because those lots produced using the 600 fpm extrusion rate exhibited splits and ruptures she had not observed in the FAT (tr. 3/162).

Lots 11-14 Are Rejected

55. By letter dated 5 January 2011, CO Dant notified EBA&D that the LAT reports for lots 11-14 had been reviewed by the government and were disapproved (R4, tab 77). The CO said that the test results contradicted the contractor's 1 October 2010 email which "states that there were no rupture/vents of the 600 fpm shock tube after 14-Day T&H, Hot/Cold conditioning and function." This increased number of shock tube ruptures indicated to the CO "that the 600 fpm shock tube will not hold up as well as the 375 fpm shock tube in storage, especially long term (up to 20 years)." She went on to state that "[t]he change to 600 fpm was to have production labor hours reduced from 11.3 hrs. to 8 hrs., but adds no quality value to this product." She said that the government "does not concur with this manufacturing change" to 600 fpm and noted that "EBA&D has returned to the 375 fpm shock tube production, which is the baseline for both contracts." (R4, tab 77)

56. On 6 January 2011, Mr. Bartholomew informed his team that the government had rejected lots 11-14, and he had prepared a two-page paper with his thoughts in advance of a team meeting the following day (R4, tab 115).

57. Because the Navy indicated the rejected lots had a number of vents, he pulled the historical record of test data sheets from the first ten LATs to determine "if a typical lot vented any more or less than the lots in question" (tr. 2/76). Taking data from nine of the first ten lots, which consisted of three lots tested according to Plan A and six lots tested according to Plan B, he arrived at an average of 6.7 vents per lot. Mr. Bartholomew compared this rate to an average of 7.7 vents in lots 11-14, three of which were tested pursuant to Plan A and one by Plan B (R4, tab 115 at 4927; tr. 2/76-77). Mr. Bartholomew testified his data showed the number of vents in lots 11-14 were "in family" with those experienced in the earlier lots, there was no basis for rejecting the four lots due to venting because the lots met all TDP requirements, and the lots should be accepted (tr. 2/77-78).

58. Mr. Bartholomew sent a letter dated 11 January 2011 to the CO, disagreeing that the "MK 154 product in these 4 lots represents a physical or performance change to the baseline configuration for the MK 154 or any other lots previously accepted under the referenced contracts." He mistakenly denied that first article testing "was required, or performed" on the subject contracts. He also stated

that "[s]hock tube venting during functioning is a common occurrence" and "there are no requirements in the Navy TDP for the MK 154 that prohibit venting of the shock tube." Mr. Bartholomew pointed out that there was an average of 7.7 vents per lot for lots 11-14, compared to 6.7 vents per lot in lots 1-10. (R4, tab 78 at 1528-29)

59. He defended the "production rate change from 375 fpm to 600 fpm [as] a minor change [in accordance with] EIA649 (does not affect form, fit, or function of the end item, the MK 154)." Further, he said that EBA&D had coordinated this with the government beforehand and believed no further approval was needed. He pointed out EBA&D had conducted an extensive validation program of the 600 fpm process which had produced acceptable shock tube. Following this, with government agreement, he said, EBA&D incorporated the 600 fpm process into its production with "the proviso being that plan A LATs would be performed on lots 11 and 12." He noted that these lots, along with subsequently produced lots 13 and 14, "passed all the performance requirements of the TDP, and performed similar to previous lots on both contracts." (R4, tab 78 at 1529-30)

60. CO Dant, by email dated 11 March 2011, asked COTR Robinson, "Is the venting an issue that we can reject on? I think I remember that you told me no." (R4, tab 117 at 5592)

61. In a 14 March 2011 letter to EBA&D, CO Dant contradicted appellant's 11 January 2011 assertion regarding no FAT, pointing out that a FAT was required on the contracts and had been performed (R4, tab 81 at 1549).

62. In the letter, the CO denied that the government had concurred in the production rate change and stated the production rate of 375 fpm, "in accordance with the item specification 3.4.5 Configuration Control," was frozen as the baseline configuration for production on the contracts when the government accepted the FAT. She observed EBA&D had "informed the Government that the configuration baseline was changed from 375 fpm to 600 fpm on these four lots, but did not submit any type of request...for the process change." (R4, tab 81 at 1549)

63. On 29 March 2011, EBA&D conducted information-only testing on lots 13 and 14 for the benefit of Mr. Bartholomew (R4, tab 118 at 4976). He testified he knew the lots had been rejected and had been told, both by government and EBA&D personnel, that the sounds during the testing were louder than usual in the earlier testing of these lots. As program manager, he wanted "to see for myself, and the only way to do that is to rerun the test." (Tr. 2/153-54) This testing showed that 11 out of 20 T&H samples in both lot 13 and lot 14 vented (R4, tab 118 at 4976).

64. In a 31 March 2011 letter, EBA&D sought a "first article determination (for MK154 lots 11-14 only) for a process change that had occurred." EBA&D, quoting the

contract, admitted that it was required to notify the CO whenever a change occurs in the place of performance or manufacturing process in order that a determination could be made regarding the need for an additional first article sample and testing. EBA&D disagreed with the CO's assertion there had been no conversations with government representatives in regard to the change, referencing the testing requested and witnessed by the government's technical authority. However, it agreed it had failed to submit "the required formal notification of process change to your office." (R4, tab 84 at 1559)

65. EBA&D asserted it increased the manufacturing speed to maintain production capacity, and presented a product to the government which conformed to all contract requirements. However, the letter went on, the government rejected the lots "for venting." Venting, according to EBA&D, "is normal and expected, as demonstrated by data" that EBA&D provided to the government and "[f]or the Government to reject these lots for venting would be to hold EBA&D to a higher standard than currently required by the contract." Appellant stated that after comprehensive evaluation and validation, "the lots were subjected to two (2) Plan A LAT's, as requested by the Government technical authority and such testing was also witnessed by the technical authority." The letter explained that because of government concerns, EBA&D had performed additional in-house testing, was certain the product would pass a FAT, and proposed an FA sampling plan. (R4, tab 84 at 1559)

66. The CO replied on 19 April 2011 that "[w]hile there were concerns addressed in previous correspondence" referencing letters regarding venting for the lots in question, "the issues discussed were not the reason for rejection." She stated that no modifications had been issued for the contracts to change the item specification, 3.4.5, Configuration Control, "to allow EBA&D to change the configuration baseline from 375 fpm to 600 fpm." She went on to say that "[t]he Government appreciates EBA&D's efforts, but will not retroactively approve the configuration change." She repeated that lots 11-14 "are not acceptable." She also reminded EBA&D to continue performance on the contracts. (R4, tab 86)

67. By email dated 5 May 2011, EBA&D's president, Brendan Walsh, corresponded with the CO in an attempt, he said, to "resolve and clarify the issue with the rejection" (tr. 1/47-48). He testified he wanted to show the CO that appellant and the Navy had discussed the change in the extrusion rate and what type of testing would be required (tr. 1/52, 68-70). His email states he had "attached some basic meeting notes that Jeremy Stewart took during a team meeting that was held on August 8, 2010 to discuss what testing was needed" (*id.*). Mr. Walsh's email listed the meeting's attendees, and included Barbara Robinson's name (R4, tab 88 at 1571). However, she testified she "[doesn't] remember being at any meeting" (tr. 4/46). The email's attached notes indicate that lots 11-14 were manufactured at a run rate of 600 fpm as opposed to the 375 fpm run rate used with earlier lots. There is a handwritten note on the sheet from the meeting that says, "Do some additional testing....Lot 11/12 plan," and there is an arrow to

the name "Barb" and the date, "8/19/10." (R4, tab 88 at 1573) COTR Robinson testified she spoke with Jeremy Stewart in August 2010, and that Mr. Stewart told her he did not want to do a FAT. She testified she told him to follow the specifications. (Tr. 4/46)

68. Mr. Walsh also sent the CO an email string from November 2010 wherein COTR Robinson is concurring with EBA&D personnel to test lot 13 with a modified Plan A test, and to test lot 14 using Plan B (R4, tab 89; tr. 1/51-52). The email is addressed to both EBA&D's Steve Lintner and the CO.

69. EBA&D's president followed his emails to the CO with a telephone call on 19 May 2011 (R4, tab 90; tr. 1/53). The CO told him again the lots were not acceptable and that EBA&D had no contractual authority to change the contract. Mr. Walsh responded that EBA&D produced lots 13 and 14 prior to the Navy accepting lots 11 and 12 because it was thought to be a low risk, and otherwise they would have had to "send workers home." Further, he said all the units functioned so they should be accepted. The CO told him they may function, but not at the level of quality set by the FAT and prior LAT acceptance on the contracts. (R4, tab 90, tr. 1/71-74)

70. On 8 July 2011, Mitch Boggan, EBA&D's contracts administration manager, requested the government's determination for first article testing of an "improved" shock tube. EBA&D indicated it had made two changes in its shock tube, one of which was replacing Ethylene-Vinyl Acetate (EVA) Ateva part number 1210, which was the plastic resin used for the connecting web in all of EBA&D's dual shock tube, with Ateva part number 1221. Ateva part number 1210 had been discontinued by the manufacturer. EBA&D indicated it had performed testing on the new part number, the data was included with the attached test report, and it was acceptable for use in the manufacturing of dual shock tube. (R4, tab 94 at 1596-97) There is no indication in the record that the plastic resin in the connecting web of the dual shock tube had an effect on venting, rupturing, or splitting of the shock tube.

71. The other change in EBA&D's FA Determination Request was an increase in the extrusion rate from 375 fpm to 600 fpm, which would alter the dimensional and physical properties of the shock tube. Mr. Boggan explained EBA&D had improved the shock tube's "physical properties in conjunction with increasing the manufacturing process rate" and listed the following impacts the redesign had on the product:

> 1) Reduced Shrinkage – reduces tube deformation on a spool when exposed to elevated temperatures. This can also promote fewer potential "vents" upon function.

2) Optimised [sic] the explosive coreload...to reduce powder migration and thereby also reducing the potential for "vents."

....

This new shock tube design is not the same as the previous design. It has revised physical parameters to reduce shrinkage and optimise [sic] coreload thereby reducing the occurrence of vents and blow outs.

(R4, tab 94 at 1596-97)

72. The government approved the July 2011 FAT and the lots produced in accordance with it in September 2011 (R4, tabs 102-03).

The Litigation

73. On 12 July 2011, EBA&D submitted a certified claim "for additional costs associated with the improper rejection of conforming product" (R4, tab 95 at 1685). Appellant alleged a "constructive Change pursuant to Contract Clause FAR 52.243-1, Paragraph (a)(l)" and claimed a total of $911,293.13. EBA&D sought $847,968.00 for product rejected without justification, $60,030.00 for a constructive stop work order between 10 March 2011 and 17 April 2011, and $3,295.13 for severance expenses for "three producers laid off as a result of this constructive stop work."[8] (*Id.* at 1688)

74. EBA&D asserted it had not altered the configuration baseline, as the government alleged, because run speed was not a configuration criterion in any of the contract documents. However, even if it was, EBA&D had worked closely with COTR Robinson who concurred "with the proposed test plan to validate the run rate change." It was only after COTR Robinson did not like the test results due to other "concerns," stated appellant, that the government invoked a "process change" or "configuration change" as justification for its rejection of the lots. EBA&D described these concerns as "rupturing (so called 'venting') of shock tube, which has existed to one degree or another on all prior lots" and pointed out that "absence of venting or rupturing is not an acceptance criterion on either Contract." (R4, tab 95 at 1687) Therefore, according to appellant, "the Government has acted to impose arbitrary acceptance criteria for MK154's not embodied in the drawings, designs or specifications cited in the subject contracts" (*id.* at 1688).

[8] We express no opinion regarding those portions of EBA&D's claim seeking to recover for a constructive stop work order and associated expenses, as these are better considered during the quantum phase of litigation.

75. CO Dant, in a 5 August 2011 letter, notified EBA&D that she had received the claim and would make a decision "on or before July 12, 2012" (R4, tab 96 at 1723).

76. On 16 September 2011, the contractor informed the CO that this "lengthy period" was unacceptable (R4, tab 98 at 1730).

77. On 6 January 2012, the Board received the contractor's notice of appeal, predicated upon the CO's deemed denial of its claim due to the CO's failure to render a final decision (COFD) after an "unreasonably long passage of time." We docketed the appeal as ASBCA No. 57929.

78. The CO issued a COFD on 16 April 2012 denying EBA&D's claim. Quoting from her 5 January 2011 letter, she listed the number of ruptures/venting from the lots 11-14 samples tested and said that these failures resulted in her conclusion that product manufactured at 600 fpm would not hold up as well as that manufactured at 375 fpm. She stated that EBA&D had changed its manufacturing process from 375 fpm to 600 fpm for these four lots without technical activity concurrence and without procurement contracting officer approval. The change "resulted in changes to both the 'product attributes' and the 'physical attributes' of the product," constituting "without question, a change in the configuration baseline." The configuration baseline, frozen with government acceptance of the first article, established the basis for defining a change. (R4, tab 1 at 1-2) "EBA&D's change in its manufacturing process directly changed the functional characteristics of the product as evidenced by the violent rupturing during function of the Temperature and Humidity (T&H) test units." The results showed "[r]upturing at this magnitude had never been witnessed and/or reported before in previous [lots]." (*Id.* at 3-4)

79. She pointed out that appellant admitted in its own 30 September 2010 email to COTR Robinson regarding the change to a 600 fpm extrusion rate, that "[i]n order to accommodate this increase in speed it was necessary to adjust the parameters of the Shock Tube manufacturing process in order to obtain the same cross-sectional dimensions." According to the CO, "[a]n adjustment of the parameters of the Shock Tube manufacturing process clearly constitutes a 'manufacturing change' or 'process change.'" (R4, tab 1 at 3)

80. In contradiction of EBA&D's statement that the run speed was "not a configuration criterion in any contract document," the CO wrote, "The First Article was to be manufactured using the proposed methods in accordance with [the specifications]" and "[t]hese production methods were frozen as part of the configuration baseline with the Government's acceptance of the First Article" (R4, tab 1 at 3).

81. CO Dant disagreed with EBA&D's statements that COTR Robinson concurred with the run rate increase when COTR Robinson agreed to EBA&D's proposal to the test plans. According to CO Dant, the purpose of the testing was to determine whether or not the government would approve the run rate change. The government concurred with running the test plan, not the run rate change of the manufacturing process. Testing on the lots was not complete until 1 December 2010, and EBA&D had manufactured all four lots before then. Based upon the testing, the CO rejected the lots. CO Dant indicated that EBA&D assumed the risk when it continued to produce lots prior to the completion of "Plan A" testing on lots 11 and 12. (R4, tab 1 at 3)

82. In response to EBA&D's statement that the government had no reasonable basis for rejection of the product, either with regard to configuration changes or rupturing/venting, the CO disagreed. She stated the test results had shown "violent ruptures of the shock tube T&H" units manufactured at 600 fpm under cold and ambient conditions never witnessed or reported in any of the previous lots, which were manufactured at 375 fpm. (R4, tab 1 at 4)

83. She also disagreed that EBA&D was delayed by the government. She noted that lot production continued without a break and additional lots were produced during this period. Testing was completed on the subject lots in December 2010 and these lots were rejected 5 January 2011. No "Stop Work Order" had ever been issued. Further, according to the CO, appellant could have mitigated its damages. "EBA&D should have recycled and/or reused components from the rejected lots as has been the practice in the past." (R4, tab 1 at 4)

84. In the course of discovery, the government learned that EBA&D had discarded detonators tested in the fall 2010 LAT, and had also discarded the units EBA&D had tested in-house in March 2011, even as it contemplated filing a claim. Thereafter, government counsel asked appellant to run tests on some samples from the remaining lots 11-14 shock tube stock, and filed a motion with the Board for an adverse inference when EBA&D refused to do so without compensation and only under limited conditions. *Ensign-Bickford Aerospace & Defense Company*, ASBCA No. 57929, 13 BCA ¶ 35,322. The Board found that EBA&D had discarded the functioned detonators when it "knew or reasonably should have known of the potential litigation value of these functioned detonators and failed in its duty to preserve evidence." *Id.* at 173,386. However, the Board found no bad faith on EBA&D's part. The Board found that destruction of those detonators did not materially affect the government's substantial rights or prejudice the presentation of its case. The Board denied the government's motion. *Id.*

85. At the direction of the CO, EBA&D performed further function tests on T&H samples for lots 11-14 on 23-24 July 2013 (R4, tab 138). According to

COTR Robinson and QAR DiFranco, the sample units that were tested in July 2013 experienced splitting and venting similar to that observed during the previous function testing for those lots in 2010 (R4, tabs 138-39; tr. 3/169, 4/85-86).

86. At the hearing, COTR Robinson testified about charts she prepared reflecting all appellant's MK 154 production subjected to T&H testing throughout the life of the contracts, and graphically representing the number of vents (R4, tab 169 at 6630). She testified she used the description "vents" in the chart for convenience but the word encompassed vents, splits, and ruptures (tr. 3/179). The data came from the test data sheets provided with the LATs (tr. 3/182).

87. The first graph indicates there were a few vents experienced at the beginning of production (R4, tab 169 at 6630). COTR Robinson testified this was not surprising because there are always issues at the start of production. At the beginning, there were concerns regarding the innermost winding of the tubing around the spool, as well as issues with the barrier bag the product was packaged in, she said, but these were resolved after the initial ramp up (tr. 3/186-88). In the middle of her graph, however, the graph bars appear high, representing the number of vents in LATs for lots 11-14 and in the 2011 informational retest of those lots. Further towards the end of her graph, in the bars representing the July 2013 retests of those lots, the bars are also high. (R4, tab 169 at 6630)

88. On the following pages, COTR Robinson graphically represented the number of vents in all lots subjected to T&H in shock tube extruded at 375 fpm; those from lots 11-14 which were extruded at 600 fpm; and those lots which were produced after EBA&D's July 2011 FAT, which changed the design of the shock tube, run at 600 fpm (R4, tab 169 at 6631-33). The first chart reflects those subjected to T&H testing and then to the hot soak (*id.* at 6631); the second, those subjected to the T&H testing and then the ambient soak (*id.* at 6632); and the third, those subjected to T&H testing and the cold soak (*id.* at 6633). COTR Robinson testified she was concerned by what was shown in the graph indicating the higher frequency of vents in those conditioned by the ambient soak because 90% of detonators purchased by the government are functioned at ambient temperatures (tr. 3/191). The quantity of vents shown in her charts indicated to her that the frequency of such events was substantially higher in comparison to all production of the MK 154 (tr. 3/192).

89. After the hearing, the parties, by joint stipulation, arranged for the submission of a compact disc containing six video files from the 23-24 July 2013, lots 11-14 re-tests. The parties agreed the compact disc would consist of one example of a shock tube detonation where no venting was present and five examples of the government's choosing of detonations where the samples tested exhibited venting. (Tr. 4/150-51) The video was subsequently received by the Board and entered into the Rule 4 file (R4, tab 175).

DECISION

The Parties' Positions

EBA&D claims that the government improperly rejected lots 11-14 because the shock tube vented during lot acceptance testing. Unless the government proves that it properly rejected these lots, appellant is entitled to an equitable adjustment. "When the Government rejects work as being not in compliance with its specifications, the Boards of Contract Appeals have held that the burden is upon the Government to demonstrate that fact." *Southwest Welding & Manufacturing Company v. United States*, 413 F.2d 1167, 1176 n.7 (Ct. Cl. 1969); and *Yardney Technical Products, Inc.*, ASBCA No. 53866, 09-2 BCA ¶ 34,277 at 169,333-34. If the government does not meet that burden, then the contractor "is entitled to an equitable adjustment under the Changes clause" of the contract. *M.A. Mortenson Co.*, ASBCA No. 53647 *et al.*, 06-2 BCA ¶ 33,400 at 165,575 (citing *D.E.W., Inc.*, ASBCA No. 37232, 93-1 BCA ¶ 25,444 at 126,712).

The government frames its argument for rejecting lots 11-14 as follows: "This case boils down to the following: 1) The First Article Test sets the standard that production items must meet; 2) The First Article did not vent; 3) Lots 11-14 vented; 4) Because Lots 11-14 vented, they failed to meet the applicable standard; and 5) The contracting officer's decision to reject Lots 11-14 was reasonable" (gov't br. at 20). The government distinguishes between the venting which took place during the testing of lots 1-10, which it accepted, from that observed in lots 11-14. The CO's final decision rejecting EBA&D's claim calls these vents "violent ruptures." She stated that "the test reports from the T&H samples showed violent ruptures from Lots 11-14 that had never been observed before." CO Dant concluded from this that "'[n]ot only is this nonconforming, [but] it creates safety issues of deep concern...for our Warfighter.'" (*Id.* at 22 (citing R4, tab 1 at 4))

Among EBA&D's responses to the government are two key points. First, the contractor challenges the government's stance that venting is an unusual or unacceptable feature of shock tube detonation. Appellant believes that venting is common to shock tube detonation; took place during the FAT but was not a feature recorded on the test sheets until later; occurred in lots 1-10, which were accepted by the government; is not prohibited by the contract; and is not a valid basis for rejecting lots 11-14. (App. br. at 29-34, 27-38; app. reply br. at 8-11) Second, it regards the government's rejection of lots 11-14 as improper because the level of venting during the LATs was not measured using objective standards or in accordance with the contract (app. reply br. at 6-8).

EBA&D critiques the government's brief: "If the Government fails to prove any of these five elements" of the argument articulated in its brief, "which are posed in the conjunctive, then the Government loses its case." The contractor "does not

disagree with the first point – that the First Article Test sets the standard that production items must meet" but argues that "the Government cannot prove any of its other points" and so "must lose this appeal." Appellant reasons that because the "Government has failed to demonstrate that Lots 11-14 of EBA&D's shock tube were not in compliance with the specifications set forth in the TDP. [I]t has failed to meet its burden of proving that its rejection of such lots was proper." (App. reply br. at 2) The contractor contends that the "mere fact that no venting was *recorded* during the FAT does not necessarily mean that there was no venting during the FAT," hence this "cannot be a determinative criterion." Appellant points out that "EBA&D personnel testified that they believe that some of [the] units did in fact vent during the FAT," which would be "[un]surprising given that venting is endemic in the functioning of shock tube generally." Further, even if "venting were a proper basis for rejection and that there was a FAT 'baseline configuration' of no venting, the Government has nonetheless failed to prove its rejection of Lots 11-14 was proper because all its evidence that there was a difference between the 'baseline configuration' FAT and the LAT was impermissibly subjective." (*Id.* at 6)

Analysis

As it is incumbent upon the government to justify its rejection of the proffered lots, we analyze first the government's argument and the bases cited in the COFD for unacceptability of lots 11-14. We observe at the outset that the government's brief rests its rejection on "venting" and the "violent ruptures" of the product, and not because EBA&D produced these at 600 fpm versus the 375 fpm utilized in making the first article. The government repeatedly denies holding the belief that there is something inherently bad about the 600 fpm extrusion rate (gov't br. at 24). Its brief reiterates this point, stating that it "is indifferent on the rate of extrusion so long as EBA&D shows that the process change does not change the product" (*id.*), and "the record also shows that the Government is neutral with regard to the extrusion rate" (*id.* at 25). We conclude from the government's repeated assertions, that it is unnecessary that we determine whether the government might properly have rejected lots 11-14 because these were manufactured at 600 fpm.[9] As a consequence, we do not belabor

[9] We generally agree with the government that changes to the baseline configuration impose additional duties on the contractor. Use of a different manufacturing process, such as another extrusion rate or substituted component, are permitted as changes to the baseline configuration that require additional testing. *See, e.g.*, contract ¶ 3.3. First Article Sample; ¶ 3.4 Design and Construction; ¶ 3.4.5 Configuration Control; and ¶ 4 Quality Assurance Provisions (finding 6). These provisions show that the contract allowed the manufacturing process used in the FAT to change, and anticipated that there might be changes in product attributes and the resulting baseline configuration (finding 10). EBA&D complied with these requirements. In seeking to change the extrusion

EBA&D's request to change the run rate, but focus upon whether the government has proven that it rejected lots 11-14 for failure to meet contract requirements, which is the standard set by *Southwest* and its progeny. We analyze each prong asserted by the government in assessing whether it properly rejected lots 11-14.

a. The Government's First Prong: "The First Article Test Sets the Standard That Each Lot Was Required to Meet"

The government's first prong is that the FAT creates a standard for evaluating subsequent contractor submissions for acceptability in that "the First Article Test sets the standard that production items must meet." It asserts that the "contracts state that the 'First Article' is synonymous with the terms 'preproduction model,' meaning that it 'shall conform in every respect to the requirements of [the] contract[s]' and that the production models 'shall be manufactured with tools, material and methods which are the same as or representative of the tools, material and methods which were used to manufacture the First Article.'" (*See* gov't br. at 20) Although the government's narrative does not identify particular contract clauses in support of this contention, it cites specific pages of the record. Following that lead, we understand the government to rely upon the following: First Article (Contractor Testing) (NAVSEA) (SEP 1990) (finding 4) and OES-0071B, ¶ 3.4.5 Configuration Control ("The baseline configuration shall be frozen with the Government acceptance of the First Article.") (finding 7). The government cites witness testimony, but not a contract proviso, for its conclusion that "[i]tems manufactured after the First Article Test must perform like the First Article" (gov't br. at 20-21) (emphasis added).

In support of this prong and to counter EBA&D's argument that venting is permissible because it is not addressed by the specifications, the government takes the position that it was not necessary for the contract to prohibit venting. The government reasons that:

> Contracts are typically written in the affirmative – they define what the item should do, not what it should not do. The specifications here do not state that the MK154 cannot vent for the same reason the specifications for a car would not say that the brakes cannot fail. It would be very difficult to define an item by explaining everything that it cannot do. The contract defines the First Article as a

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rate to 600 fpm, it followed the contract by performing two Plan As on lots 11 and 12, a modified Plan A on lot 13, and a Plan B on lot 14. There was nothing inappropriate in its request, as it is permitted by the contract and was allowed by the COTR, who informed the CO of her intentions. (Findings 12-19, 37-47)

> "pre-production model" and "configuration baseline." In doing so, the contract makes the First Article, and all of the characteristics that were observed when it was tested, the yardstick by which all future items are measured, whether the characteristics [that were] observed during the First Article Test were expressly addressed in the specifications or not. The First Article Test, by its nature, is the contractual expression of the characteristics that shock tube should and should not have.

(Gov't br. at 27) (Citations omitted)

Discussion

We reject the government's overly-broad and unsupported assertion that the FA somehow redefines the specifications or makes the contract more stringent than its stated requirements or prohibitions.

The government misapprehends the purpose of the FAT and does not furnish contractual support for the proposition that the contractor is bound in subsequent submissions to emulate qualities that are not made part of the contract. It erroneously conflates FAT requirements, which pertain to a contractor's ability to manufacture the called-for item, with the criteria it must use in the LAT as it inspects products for acceptance purposes. The Board has held that "[f]irst article testing and inspection of supplies have distinctly different purposes....[T]he purpose of first article testing is to determine whether the contractor can produce the supplies to the contract specifications [in accordance with] FAR 9.302." By contrast, "The purpose of inspection of supplies, on the other hand, is to determine whether production [items] that have been delivered should be accepted. FAR Part 46, Quality Assurance, governs the inspection of delivered supplies and services." *Military Aircraft Parts*, ASBCA No. 60009, 16-1 BCA ¶ 36,388 at 177,410.

Other than asserting that first article requirements somehow increased the standard articulated in the TPD, the government failed to cite any contract proviso or legal precedent to support its argument. It furnishes no proof for the proposition that product qualities demonstrated during first article testing, which are not addressed in the TDP, somehow enhance the specifications. The government's assertion that it is unnecessary for the contract to affirmatively state all desirable characteristics or prohibit all unwanted ones is unpersuasive, and contradicted by terms of the instant contract. Clearly the government knew how to articulate specifications that prohibited certain traits, because repeatedly it did so here. Among relevant provisions to this effect are these: "The pyrotechnic lead shall [not separate from the in line initiator]" (R4, tab 7 at 99, OES-0071A, ¶ 3.5.1.3(1)); "The dual in-line detonator shall withstand

the transportation vibration cycle specified [without burning, exploding or becoming unsafe to handle] when tested in accordance with 4.5.2.2 and then meet the performance requirements of 3.5.1.3 when tested in accordance with 4.5.1.3" (*id.* at 100, ¶ 3.5.2.2); and similar restrictions imposed on the detonator as part of temperature and humidity testing (*id.* ¶ 3.5.2.3), meter drop (*id.* at 99, ¶ 3.5.2.1), and electrostatic discharge (*id.* at 100, ¶ 3.5.3.2). (*See* finding 5) The contract could have addressed how many and what types of vents, if any, would be acceptable; it did not.

Nor is there any proof that the government at any relevant time of contract formation made EBA&D privy to the contract interpretation it now raises in litigation. We will not impose such unstated conditions on an uninformed contracting party:

> It is well established that an undisclosed intent/interpretation is irrelevant in interpreting contract language. *Andersen Consulting v. United States & Computer Sciences Corp.*, 959 F.2d 929, 934 (Fed. Cir. 1992) ("[T]he 'subjective unexpressed intent of one of the parties' to a contract is irrelevant."); *ITT Arctic Services, Inc. v. United States*, 524 F.2d 680, 684 (Ct. Cl. 1975) (In attempting to give effect to the contracting parties' intent, the court will not consider the "subjective unexpressed intent of one of the parties.").

Distributed Solutions, Inc., ASBCA No. 57266, 14-1 BCA ¶ 35,704 at 174,842.

We agree with appellant that the government is trying to hold EBA&D to more stringent standards than required by its already extensive and demanding TDP. Where an agency imposes test and performance requirements that are more stringent than those specified in the contract, the contractor is entitled to an equitable adjustment for additional costs incurred to meet the greater requirements. *Yardney Technical Products, Inc.*, ASBCA No. 53866, 09-2 BCA ¶ 34,277 at 169,333-34; *Diversacon Industries, Inc.*, Eng BCA Nos. 3284, 3486, 76-1 BCA ¶ 11,875 at 56,897-98.

b. The Government's 2nd Prong: "The Approved First Article Did Not Vent"

The second prong of the government's argument is that the first article did not vent (gov't br. at 20-21). To substantiate this point, it adduced testimony from COTR Robinson and QAR DiFranco, both of whom said that no venting occurred during the FAT and that this characteristic would have been noted on the test sheets if it had taken place (*see* finding 31). Appellant differs with the government over the factual matter of whether shock tube vented during the FAT. According to EBA&D's Mr. Bartholomew, who was also present at the FAT, venting took place but was not recorded on the test sheets because this was not normally done. He stated that it was not until the COTR later requested that

venting be recorded that these notations were added. (*Id.*; tr. 2/57-58)

Discussion

There is no evidence from the FAT to substantiate whether venting took place. All we are left with is equally credible testimony from the government COTR and QAR that it did not and so was not recorded, and appellant's Mr. Bartholomew that it did but that it was not then customary to note it on the test sheets. We do not find the COTR or QAR to be more credible or persuasive than Mr. Bartholomew. Because the evidence is, at most, at equipoise, we are unable to conclude that venting did not occur during the FAT. The government failed to meet its burden of proving this prong by a preponderance of evidence that venting took place during the FAT. *Argo Technology, Inc.*, ASBCA No. 30522, 88-1 BCA ¶ 20,381 at 103,061. As a result, the government failed to uphold the second prong of its argument, which is a key component to its justification for rejecting lots 11-14.[10]

c. The Government's Third and Fourth Prongs: "Lots 11-14 Vented" and "Lots 11-14 Failed to Meet the Standard Set by the First Article Test"

We need not discuss in detail the government's third prong, which is that lots 11-14 vented. This point is established by the record (findings 42, 46) and is not challenged by appellant. The issue is not venting per se, but whether the venting that occurred in lots 11-14 is of consequence.

As to the fourth prong, we have in section a considered and rejected the government's position that the FAT establishes the "applicable standard." The contract articulates the standard by which items called for by this contract are to be evaluated. *See, e.g., Southwest Welding*, 413 F.2d at 1176 n.7; and *Yardney Technical*, 09-2 BCA ¶ 34,277 at 169,333-34.

However, even if the government chose the wrong "yardstick" by which to measure EBA&D's performance, the parties' briefs also examine the contract's inspection requirements in assessing whether the government has proven that it had an acceptable basis for rejecting lots 11-14 (*see, e.g.*, app. br. at 2-5, 22-23; gov't br. at 27-28; *see also* findings 13-19). The contract required LATs to be conducted, and the results evaluated according to criteria in the OES-0071A; *see* the summary in table II "Inspection Plans" (finding 14). We look at these contract requirements in assessing whether the government is correct that noise and venting or "violent ruptures" are acceptable criteria for ascertaining whether lots 11-14 were properly rejected.

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[10] We note that venting occurred in lots that were accepted by the government; these include lots 1 and 2 as well as several follow-on lots (finding 32). It is unclear at what point venting was routinely noted during testing (finding 31).

Discussion

1. "Noise" as an Indicator of Nonconformance in Lots 11-14

As to the noise level supposedly observed during the LAT for lots 11-14, the government failed to cite any relevant contract provision that was violated. Nor did it offer credible proof, as opposed to unsubstantiated assertions, that lots 11-14 were "noisier" when detonated than were lots 1-10 or that noise established a product failure warranting rejection. The government relies on the subjective impressions of the COTR and the QAR, each of whom asserted that the sounds that resulted from venting were louder than anything previously experienced (finding 39). However, the government produced no objective measurements, such as decibel readings from the various lots, for comparison. According to appellant, the government wrongly relies on COTR Robinson's impermissibly subjective, "I know it when I hear it" standard of inspection. (App. br. at 5, 33-34)

Although the COTR noted on the data sheets that venting had occurred during inspection of lots 11-14 (findings 42-44, 46-47), and in a video she is seen to "flinch" during product testing (finding 89; *see also* gov't br. at 28), we find that these unmeasured, subjective impressions do not imbue the evidence with sufficient probative value to meet the government's burden of proof. Subjective standards do not pass muster as adequate justification for the government's rejection of contracted items. *See, e.g., Pams Products, Inc.*, ASBCA No. 15847, 72-1 BCA ¶ 9,401 at 43,651 (the inspector's "eye-balling" of a surface to determine whether sand was evenly distributed raised doubt regarding appellant's alleged failure to use proper mixture in the sealant); and *Mid-American Engineering and Manufacturing*, ASBCA No. 20939, 78-1 BCA ¶ 12,870 at 62,629 (government unjustifiably terminated a contractor for failure to provide a product with "almost no bubbles" where the contract required only that "the compound be free, or almost free, of bubbles and voids" and did not establish an objective and firm requirement).

2. Venting, Called "Violent Ruptures" in the COFD, as an Indicator of Nonconformance in Lots 11-14

The government asserts that the CO reasonably rejected lots 11-14 because the "T&H samples showed violent ruptures...that had never been observed before" and created safety concerns (gov't br. at 22; *see also* at 27-28). The 16 April 2012 COFD denying EBA&D's claim stated that "EBA&D's change in its manufacturing process directly changed the functional characteristics of the product as evidenced by the violent rupturing during function of the Temperature and Humidity (T&H) test units." CO Dant said that the results showed "[r]upturing at this magnitude had never been witnessed and/or reported in previous [lots]." (Findings 78-83) The government dismisses

EBA&D's argument that venting in lots 11-14 was "in family" or similar to that seen in earlier lots. The government maintains that appellant erroneously bases this assertion on data from both Plan A and Plan B testing. It says that using Plan B results to compare venting is inappropriate, because the controverted lots were rejected due to increased venting seen only in Plan A T&H-tested samples. (Gov't br. at 29-30)

EBA&D takes exception to the government's argument that the venting in lots 11-14 was somehow different, and objects to the CO's final decision characterization of these as "violent ruptures." According to appellant, this phrase was simply a *post-hoc* litigation description coined by the CO in her final decision. It points out that the venting observed during lot testing was described in the data sheets only as "venting" and not "violent rupturing." Furthermore, argues EBA&D, venting is an improper basis for rejection since it is not addressed in the TDP, test plans, FAT, or LATs. The contractor contends that the government previously had accepted lots 1-10 despite venting in these, and challenges the rejection of lots 11-14 for this reason. (App. br. at 3, 29-34, 37-38)

We find that the government has failed to establish that venting was a valid basis for rejecting lots 11-14. While, as appellant agrees, less venting is better than more (app. br. at 4), the contract does not mention venting. Other than its misplaced reliance on the FAT (*see* section a), the government has not cited any relevant contract provision that limits or prohibits venting.

Nor are we swayed by CO Dant's use of the term "violent ruptures" in the COFD, which we understand was intended to denote something more serious than mere "venting." She employed this phrase only after verifying with COTR Robinson that "venting" was not a valid basis for rejection (finding 60). CO Dant's use of the term "violent rupturing" is particularly suspect under the circumstances, especially where the government used stronger language in evaluating the shock tube only after the appeal was underway. Although the CO asserted in the final decision that the LATs for lots 11-14 indicated that these were not of the same level of quality as those produced earlier, every sample from the rejected lots was tested according to the detailed requirements of the contract, violated no prohibition articulated in the TDP, and all items detonated properly. Absent a contractual basis, venting has not been established as an acceptable basis for the government's rejection of lots 11-14. *See, e.g., Ben M. White Co.*, ASBCA No. 36643, 90-1 BCA ¶ 22,420 at 112,167 (the government's rejection of a leaking patio was improper where the contractor complied with the contract, and the government did not meet its burden to prove that the work did not conform to those requirements).

Even assuming *arguendo* that venting was somehow detrimental to the performance of the MK 154 detonators, the standards used to reject on this basis must either be clearly articulated in the contract or the subject of such accepted industry standard or trade practice as to be common knowledge. The Board has allowed the government to justify rejecting a contractor's work where the contract does not address

the issue but the deficiency violates these recognized practices. For example, in *A&D Fire Protection, Inc.*, ASBCA Nos. 53103, 53838, 02-2 BCA ¶ 32,053 at 158,448, the Board agreed that where the specifications did not establish a standard, reliance on an industry standard is allowed upon proper evidence. *See also J.J. Barnes Construction Co.*, ASBCA No. 27876, 85-3 BCA ¶ 18,503 (the contractor was entitled to an equitable adjustment for attempting to comply with a government-imposed standard that was neither specified by the contract nor based upon any industry standard or trade practice).

The government presented no evidence, such as expert testimony or applicable trade practice or industry standard, to establish that venting was a defect so widely known to be unacceptable as to require rejection of a product even though it was made in accordance with the contract. We find that the government failed to prove that the venting in lots 11-14 warranted their rejection.

e. The Government's Fifth Prong: "The Contracting Officer's Decision to Reject Lots 11-14 was Reasonable"

We have considered and rejected the arguments in prongs one, two and four[11] that are offered to support the government's position that the CO reasonably rejected lots 11-14; *see* sections a-d. The government goes beyond these in arguing its fifth prong, and seeks to buttress its case by citing its concerns over warfighter safety and a lack of customer confidence in the suitability of lots 11-14. The government maintains that the CO acted reasonably in light of possible catastrophic product failure after detonation and resulting harm to the warfighter. It says that the military services shared these apprehensions and declined to purchase lots 11-14 because it was not "prudent to take that risk." (Gov't br. at 22-23 (citing tr. 4/130)) Despite the Board's general agreement that warfighter safety and customer confidence are laudable aims, the government must prove that safety was reasonably in question and justified rejection and were not compensable to the contractor.

The Board has upheld the government's rejection of products on the basis of safety; however, absent failure to meet a contract requirement, this may not be done at the expense of the contractor. For example, in *Hardeman-Monier-Hutcherson, a Joint Venture*, ASBCA No. 11785, 67-1 BCA ¶ 6210 at 28,748, the officer in charge of construction (OICC) on a project involving steel for antennas, rejected the use of bracing steel on the basis of safety and ordered that it be replaced. The Board found that although this action was within the OICC's discretion, it constituted a compensable change under the contract. Similarly, in *Fischbach and Moore Int'l Corp.*, ASBCA No. 14216, 71-1 BCA ¶ 8775 at 40,754 *modified. on recon.*, 71-2 BCA ¶ 9081, the Board concluded that the government acted out of an "abundance of

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[11] We have found that appellant does not dispute prong three, which is that lots 11-14 vented. This is not determinative of the outcome (*see* section c).

caution, having in mind the security of the towers" when it stopped work and imposed a requirement for seam-free welding in critical areas of tower construction. This was also found to be a compensable change to the contractor: "We also conclude that in the absence of clearer language than that employed in the specifications [that] the burden of this caution should not fall upon appellant."

We emphasize that the Board does not reach a factual conclusion as to whether lots 11-14 were safe or risk-free. Rather, having alleged that concerns over safety and risk to the customer support rejection, the government must prove its assertions by a preponderance of evidence. This requires that it do more than theorize that venting could harm the user by expelling toxic gases or igniting the remainder of the shock tube. It is clear from the record that a competent assessment of shock tube safety (or lack thereof) requires a scientific and technical determination derived from sound sources or based upon the acceptable level of a witness's knowledge. Although the government established the education and experience of its lay witnesses, we do not regard their testimony as of sufficient weight, probative value, or credibility to support a finding that these lots were unsafe. It is the Board's duty as factfinder to ensure that its findings of fact have a sound evidentiary foundation, which the government failed to provide as is its burden. *See, e.g., Parsons-UXB Joint Venture*, ASBCA No. 56481, 12-1 BCA ¶ 34,919 at 171,694-94 discussing the tribunal's obligations according to *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579, 586-87 (1993); and *Kumho Tire Co. v. Carmichael*, 526 U.S. 137, 147-49 (1999); *see also Ashland Oil, Inc. v. Delta Resins & Refractories*, 776 F.2d 281, 294 (Fed. Cir. 1985), comparing the utility of evidence offered under FED. R. EVID. 701, Opinion Testimony by Lay Witnesses and FED. R. EVID. 702, Testimony by Expert Witnesses, and the necessity of a tribunal's reliance upon testimony that is "sufficiently convincing."

The government has failed to prove its assertions offered in support of prong five nor has it shown that the contracting officer reasonably rejected lots 11-14.

DECISION

We have considered all arguments advanced by the parties, and deem it unnecessary to address those not discussed herein. The government failed to meet its burden to prove by a preponderance of evidence that it reasonably rejected lots 11-14.

EBA&D's appeal is sustained. We remand ASBCA No. 57929 to the parties for resolution of quantum.

Dated: 20 October 2016

REBA PAGE
Administrative Judge
Armed Services Board
of Contract Appeals

I concur

MARK N. STEMPLER
Administrative Judge
Acting Chairman
Armed Services Board
of Contract Appeals

I concur

RICHARD SHACKLEFORD
Administrative Judge
Vice Chairman
Armed Services Board
of Contract Appeals

I certify that the foregoing is a true copy of the Opinion and Decision of the Armed Services Board of Contract Appeals in ASBCA Nos. 57929, Appeal of Ensign-Bickford Aerospace & Defense Company, rendered in conformance with the Board's Charter.

Dated:

JEFFREY D. GARDIN
Recorder, Armed Services
Board of Contract Appeals