

QA

From: CMDHQ::QA 22-MAY-1984 11:21
To: DETOL
Subj: Suggestion No. KIR-83-0071, Jet Water Cutting

21 May 84

SUBJECT: Suggestion Number KIR-83-0071 - Jet Water Cutting
SUSPENSE: 20 July 1984

TO: All AFCMD Detachments (Less Thiokol)

1. A suggestion was submitted by an AFPRO employee to improve manufacturing operations and to cut costs. The contractor has accepted the suggestion and implementation is underway. The suggestion is forwarded to you to have the contractor consider implementation in their manufacturing operations.

Suggestion KIR-83-0071 - "(a) Water Jet Cutting can be used DOD wide for cutting Epoxy cloth, rubber, carbon cloth.

(b) This suggestion was the contributing factor in implementing the Water Jet Cutting, etc. and the Gerber Knife Cutting now in use by Morton-Thiokol Corporation (Contractor).

(c) Estimated life cycle of the Water Jet cutting machine is 15-20 years.

(d) Estimated life cycle of the Gerber Knife is 15-20 years with replacement of knife blades on a yearly cycle. Cost of knife blades is negligible.

(e) Five year projected savings is \$2,969,563.00."

2. Request you submit the foregoing suggestion to your contractor for his consideration. Please forward a copy of your transmittal letter to HQ AFCMD/QAO and the contractor's response, when received. We would like to receive the contractor's response by 20 July 1984 (could be an interim reply if final decision has not been reached prior to that date). Your assistance in this matter is appreciated.

/s/
WILLIAM E. LOUNSBURY, Colonel, USAF cc: AFCMD/XN
Director of Quality Assurance

THE UNITED STATES OF AMERICA
RECORD OF DECISION

Evaluation

I have examined the suggestion from QA management dated 21 May 1984 on the subject of Water Jet cutting of composites. The suggestion addresses the advantages of Water Jet cutting compared to Gerber Knife cutting. This is not a new subject. I have always liked Water Jets and recommend the technology wherever they can be used.

I am the Engineer for manufacturing all products on contract at this location. My responsibility includes the manufacturing process for graphite composites. The manufacturing process for composite parts can determine the selection of equipment. The contractor can be free to decide if the contract does not specify a mandated technique or the contractor can be without choice if included in the specification. The specification can be changed to be more specific or to specify an alternative process. This would be my preferred approach in any case thereby avoiding a suggestion of this type.

Decision

I continue to advocate the use of Water Jets where the results are acceptable. However, I have decided the contractor is not required to respond to the QA suggestion. Furthermore, I have decided not to request a proposal from the contractor at this time. That is my right "at any time" under specific contracts. As proven, the choice of equipment in this case would directly affect the actual costs of performing the contract including direct and overhead costs.

Therefore, my official decision in the name of the United States is "NO RESPONSE IS REQUIRED" of the contractor. This decision is binding on the government and the contractor. Parenthetically, I have considered the contractor's current performance in providing already promised technology. That effort is currently in process and so far discouraging.

JESSE DON HICKSON III
UNITED STATES

DATE STAMP
IN ERROR

1 Aug 84 11:15 am

27 JUL 1984

1984 JUL 32 AM 7:44

Rec'd
11 Jul 84
7:44

Review of Suggestion Number KIR-83-0071

AFCD/QAO

1. We have reviewed your request regarding the contractor's response to water jet cutting applications at this facility. According to Northrop Technical Manager, the application of water jet cutting applications is one of the IED efforts to be developed when resources become available.

2. The Automated Composites Center under the direction of Mr [redacted] has purchased a water jet cutter. However, the cutter has not been installed due to budgetary constraints and a shortage of manpower. The water jet cutter, when fully implemented at Northrop, would be used to cut epoxy and graphite type materials. There are several advantages and disadvantages of using water jet equipment such as outlined below:

ADVANTAGES

DISADVANTAGES

- a. No stress/no deformation while cutting on materials.
- b. Clean straight cut in grain direction.
- c. Low maintenance of equipment.
- d. No airborne dust.
- e. High cutting speed.
- f. Minimal waste of material
- g. Ease of shape cutting
- h. Cost from 1/4 to 1/2 of the gerber knife that is presently being used.

- a. High noise level, 85 decibels, requires a collector or honeycomb table to reduce noise to acceptable level.
- b. Cuts a ragged and/or grooving edge on ply when cutting perpendicular to grain surfaces.
- c. Metals other than foils are not practical for cutting.
- d. Prepreg materials retain 3 to 4 times the amount of water up to forty (40) minutes after cutting, then drops to 1 1/2 times after this time, compared to a knife cut (hand or gerber machine). Thus prevents immediate packaging of material and also is a cause for porosity as water is the main contributor for this element.

3. Northrop's Materials and Process Group has indicated that they do not want to have their Automated Composites Center group to cut prepreg materials. Reason being, they believe water will migrate into the materials that could have an adverse affect, such as porosity. Also, McDonnell Douglas Materials and Process group has done some testing of prepreg materials to fine out what

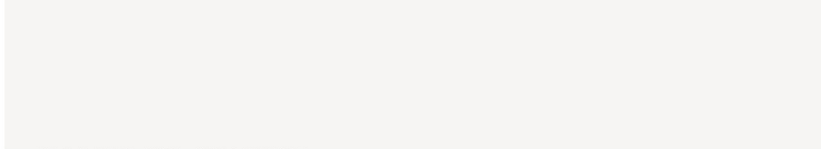
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affects the water contents would have on similar prepreg applications. The AFFRO/FHF feels that the water that is collected in prepreg materials can be removed readily and quickly by using some type of pressurized air or heat system to retract the water contents when used in stated application.

4. We recommended to the contractor that they further explore the full utilization of the water jet cutter.

5. In the event further information is desired, please contact



Chief, Manufacturing Operations
Division

g. The results of a manufacturing engineering process evaluation is to be communicated to the contractor. -

(1) A manufacturing engineer should observe the general considerations below in making all such communication.

(a) The contractor is not obligated to implement any recommendations not required by contract.

(b) Suggestions or recommendations implemented by the contractor in good faith beyond the scope of existing contracts may be construed to be constructive changes for which the government may incur additional cost.