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From: Director, Naval Research Laboratory, Washington, D.C. 20390 To: Chief of Naval Material (ATTN: PM-16)

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Subj: Laboratory Participation in Preparation for Procurement, Fleet Satellite Communication System, Space Segment

 A number of NRL staff members have been extensively involved in the development and review of voluminous documentation in preparation for the Request for Proposal for FLTSATCOM Since the management plan for FLTSATCOM may set a precedent, constructive comment may be in order.
Participating in this effort has led to concern that the present documentation and analysis process tends to obscure or confuse what should be fundamental objectives: sound design, simplicity, use of proven circuitry and components, thorough engineering, operational reliability with long life, and graceful degradation. The mountain of paper involved in the RFQ and the contractor proposals tends to give a false sense of security that programs like this are well planned and proceeding satisfactorily.

3. A good example is the rapidly growing emphasis on quality assurance documentation in an effort to improve reliability. It has now reached the point where some management representatives apparently feel that they will have a reliable system if all the blanks in check-off sheets are properly filled in. What has been lost sight of is the fact that perfect workmanship in construction and even in testing cannot improve a poor design.

4. The history of spacecraft programs has shown that good basic design work with an emphasis on simplicity has produced spacecraft which have performed well beyond their design life without the benefit of an elaborate formal quality assurance program. Conversely many complex spacecraft have been produced under very elaborate and expensive quality assurance programs that have failed early because of poor or even defective design work.

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5. The Navy R&D community should realize that quality assurance efforts can only contribute to preserving the reliability that is inherent in the basic design. It cannot improve a design; it can only prevent defects. The latter is an important function, but primary emphasis and effort should be directed toward starting with a design that is inherently reliable and, secondly, striving to preserve the reliability.

6. Information requested in proposals pertaining to design details is virtually certain to elicit a "snow job" from prospective bidders. Where except from handbooks, technical libraries, and imagination can design details for a complex system be derived in 30 to 60 days of proposal preparation? The result of using this procedure is usually a mass of inaccurate and misleading information which proposal evaluation teams must wade through, yet which may have little or no relationship to the final product, and which may even serve to obscure the true capabilities of the competing companies. An additional regrettable tendency associated with the detailed proposal preparation is for the successful contractor to stay with his hurriedly prepared design because the customer selected his proposal over the others submitted. There is no incentive or provision for the successful contractor to reexamine or improve his design during the early part of the program, subject to Navy review and approval. 7. A cogent letter concerning the process apparently from a supplier of aircraft components appears in the current issue of Aviation Week and Space Technology (January 24, 1972). A copy is attached, but one sentence from the letter seems to sum it up. "You can't increase the quality

stage."

8. The problems which rendered the first two DSCS II satellites initially inoperative and can cost the program upwards of \$50 million and delay this urgently needed system by a year or more was not prevented by a mountain of paper, but could potentially have been avoided by adequate monitoring of TRW design engineering efforts by people with the kind of experience to be

of the equipment supplied merely by supplying more paper in the proposal

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found in the COMSAT Corporation Laboratory and engineering organization or at NRL.

9. The reason COMSAT is cited as an example is that it is a customer for spacecraft which must provide an economically viable system. To assure this, COMSAT has developed strong in-house laboratory and engineering capabilities. COMSAT's programs have been generally successful compared to those of the Department of Defense, and where INTELSAT satellites have had trouble (after they got into orbit), it was not because the potential difficulty had not been brought up and considered but because the contractor insisted on going ahead with his design for reasons of economy. 10. It is the opinion of this Laboratory that the Navy should learn from experience, that of others as well as our own. The management structure associated with FLTSATCOM could provide the Navy with a unique opportunity to take the lead in changing present procurement policies so that more emphasis is placed on good basic design, and excessive and nonproductive paper work is reduced to manageable and useful proportions. 11. The Naval Research Laboratory wishes to continue to render any assistance within its capabilities in the procurement of this important system and those which follow it.

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U.L. Wallin

Aviation Week & Space Technology, January 24, 1972

LETTERS TO THE EDITOR

Year by year it is getting tougher to prepare a proposal. An aircraft manufacturer establishes a specification for a simple mechanism and requests proposals from various suppliers who have capability in the particular field of work. Maybe five to ten vendors will respond. The vital elements - cost and design - are the easier portion of the proposal to prepare, and these items are the easiest for the buyer to evaluate.

What is hurting us is the requirement that each proposal must include as much design and paper support as the actual performance of a production contract would require.

Anyone who has made proposals in the last five years knows what I mean without listing the vast quantity of information that is now required.

How can the buyer possibly evaluate the detailed response that his five or ten vendors are required to supply?

We, as suppliers, are swamped with the meaningless task of preparing lists of materials, finishes, nonessential stress calculations, "ility" analysis, etc., etc., which parrot the requirements of the buyer's specification.

A good design, at a good price, from a good supplier, is shot down if all the garbage responses are not included.

Good judgment concerning the merit of the equipment being proposed has been replaced by a point system evaluation of the proposal wherein a team of nit pickers looks for the paragraph response which each nit specialist is responsible for.

The system is grossly wasteful of manpower within each of the prospective suppliers companies, as well as within the buyer's organization.

The abortive aircraft we now have in our inventory show that the system is not working. You can't increase the quality of the equipment supplied merely by supplying more paper in the proposal stage.

It is no good having any of this if the airplane can't get off the ground.

Name Withheld by Request

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