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UNITED STATES GOVERNMENT

Memorandum

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AUG 5 10 25 AM 1970
SC-DA

DATE: AUG 5 1970

TO : DA/Director of Medical Research & Operations

In reply refer to:

FROM : EW/Principal Investigator, Experiment M-487

EWI-DA-70-0295

SUBJECT: Conduct of Skylab A Experiment M-487, Habitability/Crew Quarters

Please refer to your memo DA-70-M431 dated July 20, 1970, recommending an alternate approach to the conduct of subject experiment.

The criticisms made in your memo are well-founded. As presently planned, M-487 will indeed turn out to be little more than a quantitative reporting of the habitability experience of Skylab A in terms that, hopefully, will be useful to the designers of future spacecraft. M-487 certainly will not be an "experiment" in habitability, nor will it be conducted along classical lines.

From your memo, I judge that you are not so much concerned over how M-487 is being conducted as over the fact that it is identified as a bonafide experiment, when it really isn't. You seem to feel that our reputation for carrying out the principles of scientific methodology will suffer thereby. You recommend that we petition to have the whole endeavor reclassified as some sort of operational activity. You are probably correct in your prediction that our reputation will suffer in the eyes of some people; but, we chance to lose a damned sight more, if we lose the present classification.

One of the few levers this Center has over the configuration of the habitability aspects of Skylab is the prerogative that we have in the person of the Principal Investigator to report to the scientific world the efficacy of Skylab as a habitable space station. Once we formally reclassify the present "experiment" as a routine, post flight evaluation, we lose the P. I. and our only unique prerogative. Whether you like it or not, we had better keep the P. I. - whoever he may be.

The M-487 Experiment Requirements Document draft which was sent to MROD was intended to elicit detail and specific data acquisition requirements that MROD thought would improve our evaluation and understanding of the performance of Skylab--particularly in those areas of habitability in which MROD takes a special interest. The Experiment Requirements Document which I plan to submit admittedly does not describe an experiment conducted as you think proper; but, however the experiment is



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conducted and however it may be reclassified, detail data acquisition requirements from each and all of the interested disciplines must sooner or later be compiled into some sort of comprehensive document for submittal to Skylab Program Office. At the moment the Experiment Requirements Document is the most convenient instrument available to that purpose.

Mr. E. H. Olling is working with me to compile a more comprehensive draft of the Experiment Requirements Document. We are already somewhat behind our committed schedule. I would appreciate it very much, if your Directorate would help us with the job on the basis that our combined efforts will not be lost to the program--whatever the outcome of Experiment M-487.


C. C. Johnson

cc:
EA/M. Faget
KA/C. Charlesworth
KW/R. Machell

EWl:CCJohnson:lgp 8-4-70

JUL 20 1970

DA-70-M431

MEMORANDUM TO: EW/Principal Investigator, Experiment M487

FROM : DA/Director of Medical Research
and Operations

SUBJECT : Habitability Support

This is in reference to your memo BW1-MA-70-0238, dated June 30, 1970, with which you enclosed the draft Experiment Requirements Document for the Habitability/Crew Quarters Experiment M487. I wish to recommend an alternate approach to the objective of achieving suitable habitability in Skylab rather than pursuing this goal in the artificial context of an experiment.

I fully appreciate your position in this matter and I am aware of the substantial efforts you have made to persuade the responsible authorities in NASA to take a "new look" at this subject over the years and the almost insurmountable obstacles that you have encountered in this endeavor. Nevertheless, after reviewing the Experiment Requirements Document, I find so many glaring departures from the principles of scientific methodology and experiment design, that I believe the image of this Center as a focal point within NASA for the definition and development of creditable experiments in the biomedical and behavioral sciences will be severely impaired if we continue to put forth our attempts to improve the habitability of the Skylab crew quarters under the guise of flying an experiment.

The great strength of this Center in the area of habitability lies in the concentration we have here of talented and experienced personnel in E&D, FCOD, and MROD, who can, if their skills are properly marshalled, unquestionably define the requirements, supervise the design, and manage the development and manufacture of manned space vehicles with excellent habitability characteristics. Within the Medical Directorate alone, we have individuals with highly developed talent and skill in the definition of environmental parameters, in the field of human factors considerations and hardware design, in identifying the essential features of personal hygiene needs, and of course, in the area of food, water and waste management systems criteria and standards. It is essential, if these people are to be effective, that they make

their presence felt during the definition, design, development and test phases of manned space flight systems and vehicles. The same statement can, of course, be made for the many people in your Directorate and in the Flight Crew Operations Directorate who can support habitability. The contents of your Experiment Requirements Document do not characterize, by any stretch of the imagination, an experimental approach by a team of professionals attempting to evaluate, in a systematic fashion, the significant variables that contribute to habitability in the space flight environment; but rather, the document amounts to a test plan to measure qualitatively and quantitatively a number of important engineering parameters inflight. This, in itself, is an admirable and highly worthwhile undertaking, which, if done well, will contribute a great deal to our knowledge of design requirements for future flight systems. I submit, however, that the measurements and the activity described in the M467 ERD can only logically be classified as an inflight evaluation of habitability, not an experiment in habitability.

I strongly recommend, therefore, that we collectively petition Headquarters, NASA, to reclassify this endeavor under the heading of operational mission objectives and incorporate the measurements, observations, and reporting provisions required to understand those aspects of habitability, that lend themselves to evaluation in the Skylab missions as detailed test objectives. If this subject could be properly viewed in an operational context, and I believe the diverse disciplines within the Center could readily and with a minimum of confusion, identify the appropriate measurements and subjective evaluations for the elements of habitability that you have identified as being amenable to assessment in the Skylab missions. Some of the habitability test objectives would, in fact, be achieved in the normal course of conduct of some of the flight experiments; i.e., documenting temperature and humidity readings versus subjective comfort, under well established conditions at specified locations in the workshop.

I strongly urge you as principal investigator - in name, and prime mover - in fact, to take the initiative now to transfer this study from an experimental to an operational setting, where all appropriate elements of the Center can support it through normal working channels and where it can cease to

represent a source of acute embarrassment to this Center when we seek to develop support from the academic community as a sponsor of well controlled, professionally conceived scientific experiments for manned space flight missions.

~~Original signed by~~
~~A. D. Catterson, M. D.~~ ~~Original signed by~~
~~Charles A. Berry, M. D.~~
Charles A. Berry, M.D.

- cc:
- AA/R. R. Gilruth
- CF/W. J. North
- DC/W. W. Kommerer, M.D.
- EC/R. E. Smylie
- KA/K. S. Kleinknecht
- KA/C. E. Charlesworth
- KW/R. M. Machell

DA:ADCatterson:fm 7-18-70